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Leadership Characteristics in Flexible Information Technology Environments

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This is to certify that the doctoral dissertation by

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Abstract

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by

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MBA, University of Arizona, 2006

BS, Northwestern University, 2002

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Management: Leadership and Organizational Change

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Abstract

Researchers have found that a positive correlation exists between information technology (IT) flexibility, IT effectiveness, and strategic alignment in organizations. It has been determined that within inflexible IT environments maintainability is reduced and key business factors become at risk. An IT flexibility measurement matrix was developed to assess IT flexibility however leadership characteristics were not identified for measurement with that model. Determining the leadership characteristics needed for IT flexibility was the purpose of this multiple case study. Leveraging the empowerment, situational leadership, IT-business equilibrium, and complexity change theories, the research questions were focused on the leadership characteristics exhibited by organizational and project team leadership. A purposeful sample of 20 IT nonmanagers participated in in-depth interviews and provided insights into leadership characteristics that were observed and practiced in flexible IT environments. Using deductive a priori coding and inductive data analysis, communication was identified as the leadership characteristic required by both organizational and team leadership. Other emergent leadership characteristics were having a vision, managing change, and servant leadership. The implications for positive social change are for organizations to use the results to develop leaders and teams to successfully manage flexible IT environments, enabling improved IT-business alignment. Academic institutions can provide structured training and cooperative education programs, partnering with IT organizations to develop and retain top IT talent. In addition, individuals can build knowledge and gain experience in these areas to strengthen personal and professional skills, thus increasing career potential.

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Dedication

I dedicate this dissertation to my family and friends who have supported me throughout this doctoral process. To my husband, who always encouraged me to keep pushing through and picked up the slack at home when he could. To my children, for your unconditional love and energy, yet another source of encouragement and motivation to push through. To my parents and siblings for stepping in to assist so that I could spend more time focusing on school. To my late grandmother who said to "finish and give your brain a rest"—well I can finally do that for a little while! I love you all, including those not mentioned. I appreciate all the love, prayers, encouragement, and support I have received over the years.

Acknowledgments

First and foremost, I would like to give all praise and glory to God for giving me the strength, patience, and perseverance to complete this journey. There were many times when I wanted to throw in the towel and focus on other things, but it was God who would refocus my mind and allow me to keep going. “I can do all things through Christ which strengtheneth me.” Phillipians 4:13 (KJV). I would also like to thank my committee members for their thoughtful responses and quick turnaround time. Thanks for answering my e-mails and calls and providing the necessary guidance to keep me moving forward. Thanks to all of those professors who either taught or mentored me over the years, especially during those slower, more painstaking portions of this process. Lastly, I would like to recognize all those who provided their time and insights to the research of this study because without them, this never could have been completed.

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Chapter 1: Introduction to the Study

Introduction

Conducting business in the global marketplace requires businesses to gather, share, and respond to information in an efficient manner. To accommodate the increasing pace of change, organizational leadership leverages information technology (IT) infrastructures and adapts business strategy to maintain and establish competitive advantage (Tallon, Kraemer, & Gurbaxani, 2000). Advancements in information technology capabilities have eliminated challenges such as global communication, information sharing, marketing, and the direct buying and selling of products and services.

As barriers to entry are removed and core information technology capabilities become commoditized, the leadership in organizations must identify creative ways to maintain market share and business value. Leadership must strive to identify strategies that allow more efficient and effective ways to manage all aspects of a company's information technology assets. Information technology flexibility or IT flexibility has been identified as a strategy to enable organizations to achieve overall business goals by utilizing the organizations technological capabilities.

IT flexibility is defined as the rapid deployment of technology components as enabled through a firm's existing technical and people base (Ness & Chebrolu, 2013). Tallon and Kraemer (2003) and Byrd and Turner (2000) have both further defined IT flexibility as the extent to which management can leverage procedures and processes to control the environment in which they operate. No matter the size or core business of an

organization, organizational leadership must be able to establish IT flexibility to maintain IT effectiveness (Chebrolu & Ness, 2013, Jorfi, Nor, Najjar, & Jorfi, 2011; Schmidt & Buxmann, 2011). By establishing flexible IT environments, organizations can respond more quickly to changes in business strategy that may result from unsuccessful projects or an overall change in corporate direction to maintain or improve strategic plans.

Leveraging IT flexibility as a technology strategy to work in conjunction with business strategy is a competitive advantage that organizations seek to achieve for overall business success (Chen, Wang, Nevo, Benitez, & Kou, 2017). Given that IT infrastructures can vary significantly among organizations, the process that organizations follow to achieve and maintain IT flexibility varies. In addition, what is deemed successful for one organization may be different for another. Frameworks have been defined for measuring IT flexibility (Kumar & Stylianou, 2014; Ness & Chebrolu, 2013), but the specific factors to consider and measure are undetermined.

Knowing which leadership factors are prevalent in a successful flexible IT environment is necessary to allow for proper evaluation of IT flexibility. A gap in literature existed as leadership characteristics that are consistently present in flexible IT environments had not been defined. Furthermore, it was unknown whether there was even an existence of common characteristics in flexible IT environments. The ability to establish IT flexibility is essential to ensuring an organization can consistently function through change and potential challenges.

A correlation exists between IT flexibility, IT effectiveness, and strategic alignment (Chebrolu & Ness, 2013; Jorfi et al., 2011). Ness and Chebrolu (2013)

established an IT flexibility measurement matrix as a baseline to investigate various factors that could have an impact on IT flexibility. The matrix provides a framework by which IT flexibility could be measured across organizations, however the appropriate criteria to measure within the model are unknown. Establishing which factors could be present when measuring IT flexibility allows organizations to build skills and capabilities in the identified areas.

The IT flexibility measurement matrix is a combination of the constructs of IT flexibility and the Capability Maturity Model Integration (CMMI) tool (Jones & Konrad, 2011). Connectivity, compatibility, and modularity are IT flexibility elements (Duncan, 1995; Ginsberg,1984). People, process, technology, and tools are considered components of the CMMI tool. When considered together in the IT flexibility measurement model, the elements intersect to create dimensions for additional investigation.

In this study I explored the people dimension of the IT flexibility model with attention given to leadership characteristics and skills. If a standard was defined regarding the leadership characteristics needed to work within a flexible IT environment, organizations could identify resources with the necessary leadership skills to effectively lead a flexible IT organization. Effective management of a flexible IT environment should lead to successful business implementation and execution toward the overall strategic direction (Chebrolu & Ness, 2013; Jorfi et al., 2011). According to Chebrolu and Ness (2013), positively impacting the flexibility of an IT environment strengthens IT effectiveness and strategic alignment.

Renaud, Walsh, and Kalika (2016) summarized the strategic use of IT flexibility to align with business needs as a key managerial issue if the desire is to achieve significant and sustainable organizational performance. The exact implementation of flexible IT strategies to improve greater effectiveness and alignment varies by organization (Chen et al., 2017). Flexible IT strategy implementations could be more cost effective as well. Through improvements in IT support and increased focused on areas of competency, organizations could realize greater IT cost effectiveness.

Identifying the appropriate talent to work within an organization is an important factor when assessing IT flexibility and organizational strategic implementation efforts (Project Management Institute [PMI] & Economist Intelligence Unit [EIU], 2014). The positive social change implications are many as talent management improvements could be made within organizations and could be tailored to specific needs (PMI & Human Systems International [HSI], 2014). Once a general set of leadership characteristics are defined, new and existing employees could be groomed for success early in their careers. An increased focus on employee development could lead to improved organizational climate and employee satisfaction.

College courses could be developed to help strengthen the leadership capabilities of potential IT industry employees. In addition, cooperative education programs could be developed to ensure that program participants are using and building the skills needed to be successful in IT industries. The assignments provided during work terms would focus on strengthening the appropriate leadership skills for long term success, simultaneously developing employees to be more qualified candidates for full time hire.

High school programs as well as college preparatory programs may also consider adding courses and activities to help develop applicable technical leadership skills early. In the end, hiring organizations would have a larger and more established pool of technologists to consider for employment. More focused leadership-based training over time would prepare individuals to have greater positive and sustainable impact on the business (PMI & PricewaterhouseCoopers [PWC], 2014). A significant business improvement could be reached in a shorter period of time by leveraging the results of this study.

Chapter 1 includes additional details about the relationship of IT flexibility, strategic alignment, and the benefits of leadership development and management in order to provide additional background for this study. I discuss the problem statement and purpose of the study and identify the research questions for investigation. I establish the conceptual frameworks to ground the study, which are based on theory and propositions from prior scholars. In addition, I discuss the significance and social implications of the study.

Background

IT has become the backbone of many organizations. If IT infrastructures fail or experience even minor setbacks, organizations could lose revenue or, more importantly, the faith and business of the existing customer base. If IT infrastructure challenges become prevalent within an organization, the impact could be quickly felt at the organization's financial bottom line, with potential impact to customer driven revenue and lost market share. Organizations must put significant investment into the

establishment and sustainability of their IT infrastructures in order to be able to adapt to change and maintain relevancy.

Advancements in technology can cause increasing pressure on organizations to stay current to ensure IT Infrastructures are able to support overall business processes (Davenport & Perez-Guardado, 1999). According to Luftman (2003), there is no perfect formula for how to achieve IT and business alignment, but studies have shown that a flexible IT environment enables organizations to establish and sustain such alignment (Tallon, 2008; Tallon & Pinsonneault, 2011). As strategic alignment and IT efficiencies are more commonly being viewed as organizational goals; the degree to which these factors are aligned can have positive and negative impacts on an organizations' bottom line (Chan, Huff, Barclay, & Copeland, 1997; Chan, Sabherwal, & Thatcher, 2006; Drnevich & Croson, 2013; Oh & Pinsonneault, 2007; Preston & Karahanna, 2009; Tallon, 2008). Understanding the elements that enable alignment between business strategy and IT efficiency would equip organizations with the information needed to manage that balance effectively.

IT flexibility has been directly correlated to strategic alignment and IT efficiency (Chebrolu & Ness, 2013; Jorfi et al., 2011). Gaining a deeper knowledge of the IT flexibility components is a positive step toward determining how to improve and sustain these organizational metrics. IT flexibility is defined in literature from various perspectives, including a definition citing it as a dimension of IT strategy (Croteau & Bergeron, 2001; Croteau, Solomon, Raymond, & Bergeron (2001). IT flexibility becomes a critical component to overall IT strategy and subsequent organizational alignment.

A flexible IT environment is more adaptable to a changing environment (Jorfi, Nor, & Najjar, 2017; Tallon & Pinsonneault, 2011) often this involves changes to the organizational strategy and the need for the IT strategy to remain in alignment. Organizations work to achieve an appropriate level of IT flexibility for their business by finding the appropriate balance of people resources and skills, defining processes to meet business needs, building a technology infrastructure, and identifying tools for sustainability. These are all defined as components of IT flexibility model (Ness & Chebrolu, 2013). The ability to tailor each component to the needs of a business enables the appropriate level of IT flexibility for that business' success.

Within this IT flexibility model, an opportunity exists to define the specific factors that organizations would need to consider for each component. Existing literature does not define the specific components in each dimension of the IT flexibility model. If those components are defined, a formula could be generated to allow organizations to determine the proper balance of each component for success in reaching strategic goals and business alignment. In addition, a common measurement tool would allow organizations to benchmark with other organizations as well as between internal IT groups.

The gap in existing literature with respect to the people dimension of the IT flexibility model was addressed by the research conducted in this study. The results of the data analysis provided the core leadership characteristics that are required to enable a flexible IT environment. The ability of organizations to identify, develop, and maintain talent capable of establishing and sustaining a flexible IT environment directly correlates

to the organization's ability to implement and execute overall IT and business strategy (PMI & PWC, 2014). The identification of key leadership skills needed to establish and maintain a flexible IT environment could be directly incorporated into the hiring strategies of organizations.

An investigation into the leadership factors that impact IT flexibility provides organizations with the information needed to build successful leadership and technical teams. These teams are then better equipped to support the overall IT and business strategy of the organization. According to a study by the PMI and the EIU (2014), identifying and managing strategic talent is only going to become more critical to organizations' ability to successfully implement and execute strategic initiatives. In addition, as those strategic initiatives change, it is imperative that employees have the skills, patience, and desire to accept the changes and implement new processes as appropriate to help the organization shift direction and remain focused.

If instead those individuals decide to leave the organization or if they are not proactively involved in helping the organization meet new strategic goals, then that personnel investment has the potential to become a drain on the organization. An employee distracted from the goals of the organization could lead to deficiencies in strategic implementation (PMI & PWC, 2014). The definition of leadership characteristics provides specificity to a core component of the IT flexibility model, the people dimension, therefore getting closer to being able to define an overall formula for IT flexibility measurement.

Problem Statement

Talent management practices and IT flexibility strategic initiatives must be in alignment for the establishment and nurturing of a flexible IT environment. CIOs and organizational senior leadership should strive to have more flexible IT organizations capable of adapting to changing demands to solidify IT effectiveness, sustain a competitive advantage, and increase business success. Strategic IT initiatives can be devised by leveraging talent management strategies to identify and retain the skills needed to establish and maintain a flexible IT environment. The talent management strategies regarding seeking and developing certain skills impacts leadership capability as well as team quality (PMI & EIU, 2014). Organizational leadership must consider not only the leadership skills at a particular moment in time, but the development of those skills and capabilities over time to build, design, deploy, and leverage a sustainable flexible IT environment.

The general problem was that maintainability was reduced and overall IT effectiveness at risk when flexible IT environments became destabilized (Chebrolu & Ness, 2013; Jorfi et al., 2011). The specific problem addressed was that common leadership characteristics present in stable flexible IT environments were undefined such that those characteristics could be utilized to measure IT flexibility. Once leadership characteristics were identified, they could be used within the people dimension of the IT flexibility measurement model (Ness & Chebrolu, 2013) to assess IT flexibility.

As organizations become aware of which leadership characteristics are consistently present in flexible IT environments, those leadership characteristics can be

used to build a team that has the skills needed to be successful when leading teams in flexible IT environment efforts. The ability of the leadership team to establish and maintain a flexible environment is key to business success. Understanding the leadership characteristics in the people dimension of the IT flexibility measurement model that promote flexible IT environments is pivotal. With this study, the problem was addressed by identifying through research the specific leadership characteristics that are needed to establish and maintain a flexible IT environment.

Purpose of the Study

The purpose of this qualitative case study analysis was to discover if there were common leadership characteristics that could be utilized as components to the IT flexibility model (Ness & Chebrolu, 2013). The goal was to determine which leadership characteristics are consistently identified as important in flexible IT environments. The leadership characteristics were determined based on the perspectives of various IT professionals. These leadership factors can then be utilized as components to the IT flexibility model and organizations can leverage that information to recruit and retain compatible talent to fully leverage the IT environment for successful business results and strategic alignment through improved IT effectiveness.

The study consisted of an exploration of demonstrated leadership tendencies from a global IT organization. The goal was for the study results to lead to common leadership criteria that could then be used as input to the IT flexibility measurement model (Ness & Chebrolu, 2013). If common leadership factors were determined, organizations could then consider those factors when working to staff their teams with individuals that would

help drive IT flexibility goals. The common leadership criteria could then be utilized to formulate an equation for IT flexibility that organizations could leverage to build and maintain IT infrastructures with more flexible tendencies.

By assembling a team of strategic leaders, planners, and technical personnel with the right skills and understanding geared to running a complex, changing IT environment, greater success could be achieved through those project implementations. The improved stability of the IT infrastructure would strengthen the ability of the organization to reach strategic goals regarding overall IT-business alignment (Jorfi et al., 2011; Luftman, 2003). Through the stabilization of the IT-business equilibrium model (Ness & Chebrolu, 2013), organizations will be able to manage the supply and demand relationship between business strategy and IT goals.

Research Questions

IT project success depends on many factors that were synthesized into the concept of IT flexibility – connectivity, compatibility, and modularity. The IT flexibility measurement model (Ness & Chebrolu, 2013) is a resource for potentially measuring IT flexibility. The model includes the combination of the IT flexibility constructs as well as the CMMI tool (Jones & Konrad, 2011) constructs of people, process, technology, and tools. The CCMI is an assessment tool used for defining successful organizational processes.

The purpose of this study was to explore leadership factors in successful and challenged IT environments to identify common leadership criteria that could be used as input into the IT flexibility model. Through the identification of leadership characteristics

and qualities that have an impact on IT project success, those factors could then be considered along with other inputs to the IT flexibility matrix (Ness & Chebrolu, 2013). The leadership characteristics could then be calculated as variables to measure IT flexibility.

In alignment with this purpose, the guiding question for this research was: What leadership characteristics impact IT flexibility capabilities? The following research questions were addressed in this study:

RQ1: What are the leadership characteristics exhibited by IT organizational leadership to establish a flexible IT environment?

RQ2: What are the leadership characteristics exhibited by IT project team members to maintain a flexible IT environment?

There are many factors that could impact the final result of an IT project including management activities, scope definition, and changing requirements (Taylor, 2000). Leadership influence in IT project success emerges as a prominent consideration as local leaders and team members have a direct influence on how overall IT flexibility strategies are implemented. Leaders are expected to oversee the implementation of the agreed upon strategy and team members must execute the plans. All team members, regardless of role and skillset, are required to work together as a productive team to ensure the work is completed and strategic goals achieved.

Conceptual Framework

Thomas and Velthouse (1990) defined the empowerment inventory theory to enable work groups to increase levels of empowerment. This conceptual framework

provided the structural framework to the leadership characteristics to be identified as critical to IT flexibility. The application of the empowerment inventory theory to the study allowed for insight and alignment of those experienced leadership characteristics that influence IT flexibility.

IT leadership and project teams are typically empowered through upper management to recognize fluctuations in consumer behavior and make subsequent changes where appropriate. Therefore, an investigation of leadership characteristics via this conceptual lens yielded a common framework for which the identified characteristics and skills were grounded. Studies show a direct correlation between the ability of an organization to be flexible and the management practices established (Byrd & Turner, 2000), so leveraging empowerment as a necessity relative to obtaining, developing, and applying such leadership skills was beneficial to the study.

The empowerment of employees is not happenstance. Employees develop a sense of empowerment if that is the message communicated and encouraged by leadership. The life cycle theory of leadership developed by Hersey and Blanchard (1969), later renamed to the situational leadership model, stated that there was no single best style of leadership. Instead, the situational leadership model considered that the task behavior and the relationship behavior of the leader with the employee and where those intersect determines the appropriate leadership style or guidance to be used. Task behavior references the amount of direction a manager provides and the relationship behavior references the amount of emotional support the leader provides. Within this model, the

combination of a low task and a high/low relationship factor would indicate an environment where employees are the most empowered.

I also drew upon the IT-business equilibrium theoretical model (Ness & Chebrolu, 2013) as a portion of the conceptual basis for this study. Due to the rapid deployment of IT projects, organizations will approach, if not reach, a state of disequilibrium driven by changes in business demands and IT capability. Similar to the supply and demand model of economics, the available supply of IT productivity has a direct impact on business demand. Organizations strive to reach a point of sustainable equilibrium and the supply of IT infrastructure must be flexible to meet the changes in business need.

To reach a point of sustainable equilibrium, change is required to adjust to changing supply and demand. Leaders recognize the need for change and subsequently adjust their expectations and guidance to enable teams to adapt to change. The complexity change theory (Moerschell, Banner, & Lao, 2013) addressed this change in leadership mindset in order to enable teams and organizations to adjust to change. Given that the ability of leadership to adjust their perspective to accommodate change is critical to successful business, this was the fourth theory used as the conceptual framework for the study.

When considered in conjunction with one another relative to the concepts of talent management and IT flexibility, these theories provided the framework to define how leadership capabilities of a team have a direct impact on the flexibility of IT infrastructures. The ability of organizations to identify the proper skills to help establish and maintain the appropriate degree of IT flexibility will allow organizations to more

effectively accomplish key business goals. Such stability will occur when IT flexibility is established and maintained with respect to overall business demand. As a result, the desired level of IT flexibility as well as the balance of leadership skills among the IT professionals will vary among organizations and even internal IT teams.

Leveraging IT infrastructure to produce a consistent supply for IT-business demand was a central theme of IT flexibility and critical to pursing successful IT project implementations. In this study, I investigated the leadership skills used in successful as well as challenged IT project teams in order to determine which skills were most applicable to flexible IT environments. Through a qualitative analysis of various cases from IT environments, real world examples were leveraged to address the research questions identified. All referenced theories lend themselves to qualitative research as the human experience is critical to understanding the true impact of leadership factors in flexible IT environments. The conceptual models are discussed further in the literature review sections of the study.

Nature of the Study

I used the qualitative case study research methodology to conduct this study. With the identification of leadership factors that impact IT flexibility, those characteristics can then be considered for the IT flexibility measurement model, specifically in the people dimension of the model (Ness & Chebrolu, 2013). The intent was to identify these factors based on the experiences of IT project leadership and team members. Understanding these experiences positively, negatively, and procedurally assisted in capturing the common themes that surfaced with respect to IT flexibility. The best qualitative approach

for this research study was the case study method, as I explored the IT environments and leadership culture of organizations through individual experiences of IT project professionals.

A global IT organization served as the general population for this study. From within that organization, I selected 20 IT professionals for the interview process. The goal of the study was to identify leadership characteristics that were prevalent within successfully flexible IT environments. This assessment was determined from the perspectives of IT professionals who are not in management or supervisory roles. Leadership styles naturally vary and the leadership team themselves may have a biased view of the positives and negatives of their particular leadership approaches. By selecting study participants who had experiences working under the guidance of various leaders and leadership styles, the intent was to attain more reliable and unbiased feedback regarding leadership styles in flexible IT environments.

I recruited study participants by engaging directly with the organization to identify IT professionals who had significant experience working within IT environments. The intent was to leverage a technology organization that develops and deploys multiple software products in parallel. Each product deliverable was independent such that the leadership was not shared across products and the same personnel resources were not shared amongst the projects. By utilizing this requirement, even within a single organization, the sample population had diverse IT experiences working with a diverse and potentially different leadership team in every work experience.

The maximum variation in the purposive sampling method, along with adequate data saturation through the use of 20 participants, enabled me to synthesize the data gathered from the sample and apply it across IT-business boundaries. All data was kept confidential and anonymous to eliminate any risk to individuals or the organization. Data were collected during the interview by written notes as well as a voice recording for deeper analysis. All study participants were aware in advance of the use of a recording technology. I analyzed the data using NVivo software in order to identify commonalities and themes from the interviews.

Definition of Terms

This section highlights key terms used in this study for additional clarity and reference.

Capability Maturity Model Integration Tool (CMMI): A framework for performance improvement based on an organization's business performance objectives

Compatibility: A defined component of the CMMI performance improvement framework. Compatibility references the usability factor of an IT environment from the perspective of how well it can change and interlock with other components (Duncan, 1995; Ginsberg, 1984) as well as its usability benefit from an end user perspective (Croteau et al., 2001).

Connectivity/scalability: A defined component of the CMMI performance improvement framework. Connectivity/scalability represents the quantified ability of an organization to grow or scale back IT capacity based on demand (Tallon & Pinsonneault, 2011).

Information technology (IT) flexibility: The ability of an organization to leverage or establish processes quickly in order to rapidly address change request and business requirements (Byrd & Turner, 2000; Tallon & Kraemer, 2003).

Modularity/adaptability: A defined component of the CMMI performance improvement framework. Modularity/adaptability represents the ability of the IT infrastructure to support the IT needs of an organization (Tallon & Pinsonneault, 2011).

Project success: Defined as the successful completion of a project within the scope, budget, and time constraints as agreed upon by the stakeholders at the beginning of the project. Resource and risk assessments must also be considered throughout the process.

Stakeholder: All persons of interest involved in a project or business initiative including leadership and the technical team. It could also include groups and individuals both internal and external to the IT organization.

Assumptions

In concert with the empowerment theory of Thomas and Velthouse (1990), the primary assumption of this study was that leadership and project teams were empowered to make decisions as appropriate to influence the direction of flexible IT environments. If employees were not empowered, then it could inhibit their ability to be proactive as individuals and cohesive as a team when determining appropriate strategies to maintain a flexible IT environment. It was also assumed that establishing a successful flexible IT leadership and project team would lead to improvement in IT project failure rates due to

trained knowledge in how to effectively implement and manage flexible IT environments (Kendra & Taplin, 2004, McManus & Wood-Harper, 2007).

Although the expectation was that the identification and development of proper leadership skill and talent in a project team would lead to improvements, there were other factors considered as defined by the IT flexibility measurement model (Ness & Chebrolu, 2013). Considered with other factors identified as critical to the dimensions of process, technology, and tools, the leadership skills identified in this study as critical to the people dimension could be leveraged to build a formula to measure IT flexibility. Organizations could then adjust and strengthen their teams through the use of effective talent management strategies.

Scope and Delimitations

In order to gain a better understanding of the IT flexibility model and its inputs, the leadership characteristics required to establish a successful IT environment were investigated as the primary research goal in this study. I chose the concept of talent management as a focus to help further direct the study. Understanding leadership characteristics from the talent management perspective enabled more insight into the benefit of the identified leadership characteristics. Not only is it important for organizations to hire the proper talent, but they must also educate, develop, and retain employees to fully consider the long term health of the IT environment infrastructure. Leveraging talent management strategy as the baseline for identifying leadership characteristics helped to ensure that the skills identified were not short-term requirements

but skills that would be sustainable and effective over time given proper development and attention.

The population for this study consisted of a single IT organization that is a primary producer of IT solutions. Within the organization there are numerous IT projects ongoing in parallel that may reach varying levels of project success. Each IT project was connected to the business results of the organization, though each may vary in the area of focus. Each project plays a critical role in the larger organization's IT flexibility and business success. Gaining an understanding of what leadership skills are consistently used within successful teams is important, but then understanding if those same skills are also present in unsuccessful projects was insightful. Whether those same leadership skills are identified with the unsuccessful IT project helped determine the significance of a particular skill.

Organizations with a single threaded business focus were not being considered for this study due to the lack of project variety in the IT infrastructure. Obtaining feedback from participants who work on the same projects could yield biased results for the study. The goal was to be able to compare and contrast the leadership characteristics from multiple projects and project teams within the organization. Similarly, small IT organizations were not considered for this study either as smaller organizations usually require smaller IT infrastructures. This could imply that fewer internal teams were needed to manage the IT infrastructure and teams may be shared across multiple IT deliverables. With smaller teams in charge, it may be easier for the group to be more adaptable to changing needs as well.

Although change is inevitable to an organization's ability to maintain a flexible IT environment, the tenets of change management theories were not investigated as a part of this study. Change is constant. The focus of this study was to identify the necessary characteristics to enable organizations to be more adaptable and IT infrastructures more flexible. The degree or frequency of change was not considered, instead the intent was to identify the leadership characteristics needed to properly manage any change in IT deliverables or business results.

The research problems were addressed with a talent management focus and did not focus on the drivers of the changes, therefore the leadership characteristics identified can be shared with the global IT organization population. The findings are elements for organizations to consider when building a flexible IT environment. Regardless of the core business or the specific characteristics of the IT project, the leadership characteristics identified can be used in any environment as a component to the organization's overall IT flexibility model. In addition the extent to which the components are used can be adjusted or developed as appropriate to maintain a desired level of IT flexibility.

Limitations

Though qualification criteria were specified, there was no way to know for sure if the information obtained would truly be representative of a diverse population for the purpose of extrapolating the data outside of the information technology realm. Another limitation of this study was that it is focused specifically on leadership characteristics and no other factors that could influence the people dimension of the IT flexibility compatibility matrix. The scope was to identify leadership factors that have an impact on

IT flexibility initiatives and sustainability. Although this current study addressed components and possibilities in flexible IT environments, it did not attempt to determine if there were specific correlations between any of the leadership factors that emerged.

Through this study, the existing literature was expanded in the areas of IT flexibility, business alignment, and common strategic initiatives by providing specific factors that could be added to the people dimension of the IT flexibility compatibility matrix. The matrix was derived by the integration of the results of an IT flexibility study (Ness & Chebrolu, 2013) and the CMMI (Jones & Konrad, 2011). The study did not directly address whether the leadership factors identified have a correlation to IT project success rates individually or somehow collectively with other dimensions of the IT flexibility compatibility matrix. In addition, the analysis did not specifically investigate whether the leadership factors identified would change based on specific organization, industry, or geography.

Being interconnected with IT project initiatives on a daily basis could potentially influence the outcome of the study through a bias towards certain leadership tendencies. The potential opportunity for bias was addressed by not only investigating successful but challenged IT projects to see if similar characteristics were identified in both situations. By inquiring of projects with contradictory outcomes, it would become less likely for participants to over emphasize certain characteristics that they may have a preference towards. In addition, it would have been reasonable to consider individuals from the same teams as participants to ensure input was provided from different perspectives. Going

forward, all limitations and biases can be eliminated by designing follow on studies that take each component into account and again gather data for analysis.

Significance

The ability of organizations to define, measure, and improve IT flexibility through ongoing change was found to have a direct impact on the overall IT success of an organization. IT success is an increasingly important factor in today's data driven technology environment. IT success has the ability to promote and sustain a productive IT organization and has direct correlations to an organization's ability to meet strategic IT goals that support ultimate business goals and alignment.

Establishing and maintaining a sustainable competitive advantage requires organizations to be able to adapt quickly in all aspects of their business, including IT infrastructures to support the new direction. IT flexibility is a strong measurement tool in the technology industry. It assists organizations in determining whether they are indeed considered flexible enough to support organizational goals by facilitating enough IT supply to meet business demand (Ness & Chebrolu, 2013). The research challenge was that the specific components of IT flexibility had not been thoroughly defined in order to allow IT practitioners to leverage an equation to determine IT flexibility levels relative to an established standard.

This results of this study contributed to filling the research gap by defining the specific elements of leadership that have an impact on IT flexibility in organizations. This is an original contribution as common leadership elements had not been defined in existing literature on the subject matter. Through the identification of these elements,

organizations can take proactive measures to ensure the appropriate leadership skills are present within their critical IT infrastructure teams. By leveraging talent management opportunities early on in the personnel development process (PMI & PWC, 2014), the skills of IT project teams can be broadened to flourish in an IT flexible environment capable of rapid change in order to support the business strategy of the organization. Moreover, the expectation of leadership can be predefined and job requirements can be established to identify employees who would be most successful in maintaining IT flexible environments.

The leadership results from this study may also be leveraged towards further research targeted at building a theoretical model for IT flexibility assessment such that strategic alignment and IT effectiveness could be optimally achieved. There are several components to the IT flexibility measurement model (Ness & Chebrolu, 2013) including high level dimensions of people, process, technology, and tools. Within each of those dimensions, the flexibility elements of connectivity, compatibility, and modularity can be assessed. Within this study, specific characteristics as related to the people dimension of the IT flexibility measurement model were addressed. As additional insights are defined regarding specific characteristics of the remaining dimensions of the IT flexibility measurement matrix, those can then be combined with the people dimensions findings of this study in order to formulate an equation for the consistent measurement of IT flexibility across all dimensions.

Recent studies also confirmed how talent management initiatives are critical within organizations desiring to improve IT success. Employees must be identified who

are capable of implementing and executing the necessary strategies for successful business implementation (PMI & HSI, 2014). The results of this current study could help IT organizations make better decisions regarding the optimal talent management processes to deploy in order to identify talent with the leadership qualities and development potential required to reach strategic business goals.

Through a more focused approach to leadership development, the ability to sustain a flexible IT environment and positively impact overall IT effectiveness and strategic business results will be more favorable. Such enhancements also contribute to positive social change by enabling organizations to be more cost effective in the hiring and development of leadership teams. Once specific skills are identified, those skills could be developed and employees nurtured as they work toward establish and maintain a strong IT flexibility model for a given organization.

The results of this study contributed to positive social change by enabling educational institutions to leverage the information to formulate curricula that will educate students in the leadership fundamentals necessary to be successful as leaders and technical resources in IT organizations. Colleges and universities can use the findings of this study and future studies regarding the other elements of IT flexibility to candidly inform and train students regarding the proper mix of leadership, process, tool, and technology skills to prepare them for meaningful career work and ongoing development in the IT marketplace. By enabling students in the IT and Computer Science/Engineering degree curricula to receive relevant training to strengthen those skill areas that are suggested for strong leadership in IT flexible environments, the candidate pool for such

opportunities will grow and be prepared for the available job roles and functions as the IT industry continues its accelerated growth.

Summary

This chapter introduced the concepts of IT flexibility, strategic talent management and their importance relative to each other and organizational strategic alignment and business initiatives. The driving force behind this study was the increased reliance of IT organizations on their internal IT infrastructures in order to be able to respond quickly and effectively to external changes in consumer demand and major market adjustments. Organizations desire to develop a unique business and technical skill base in order to establish and maintain flexible IT environments. Through strategic talent management development, organizations can identify, develop, and retain employees who have leadership skills specific to IT flexibility initiatives. Building such leadership skill internally, could lead to greater enablement of strategic IT initiatives, and therefore better alignment with overall business strategy.

This chapter also provided the conceptual framework used to identify the key leadership factors that are critical to IT flexibility initiatives. The intent of the study was described with respect to the qualitative research paradigm and the research questions were identified that directed the study. These elements are discussed further in Chapter 3, but first, in the following chapter a more in depth analysis of existing literature regarding IT flexibility, IT strategy, and business alignment are discussed to further understand what prior research has determined with respect to these concepts. The tenets of the prior

research are compared and contrasted with respect to the research questions defined and the methodologies selected for this study.

Chapter 2: Literature Review

The literature reviewed in this study showcases the history and rapid growth of information technology and the unique manners by which IT is leveraged to enable successful business operations. The review focused on IT flexibility, which scholars have identified as an essential quality to ensure IT organizations are capable of adapting to changing demands, sustaining competitive advantage, and increasing the probability of business success (Tallon, 2008; Tallon & Pinsonneault, 2011). The correlation that has been identified between information technology and business alignment is discussed as that relationship creates the premise for IT flexibility. I considered the literature covering additional IT flexibility concepts in the review including the IT flexibility business equilibrium model, measuring IT flexibility, and the leadership aspect of IT flexibility.

IT flexibility has been directly linked to an organization's ability to achieve IT effectiveness and business alignment with strategic goals (Chebrolu & Ness, 2013; Jorfi et al., 2011). There are many factors to be considered and potentially adjusted in order for an organization to determine the appropriate level of IT flexibility needed for business success. The balance of factors will naturally change between organizations, but it would seem that a core set of criteria would be available to establish a baseline by which organizations could set IT flexibility growth goals. However, despite the defined necessity of flexible IT environments, there is little known regarding the criteria needed to successfully establish a flexible IT environment.

IT project failure rates continue to be on the rise with projects failing to meet scope, budget, or time commitments (McManus & Wood-Harper, 2007). The assumption

is that the rising project failure rates are linked to the inability of organizations to maintain IT equilibrium or the inability to recover from a state of disequilibrium as needed to allow a project to progress. To recover from a state of disequilibrium and to establish a baseline where project failure rates can stabilize, IT organizations have to look beyond the standard project success criteria of time, budget, and scope. As an alternative, IT organizations must focus on all aspects of their strategy, which includes the process, people, tools, and the technology associated with the organization.

According to Kendra and Taplin (2004), an increased focus on the skills needed to be effective change agents will help to improve IT project success rates. Therefore, building capability in the four dimensions of process, people, tools, and technology provides a solid foundation for organizational strategy and success. A well-defined business process requires focused people to drive implementation of that process.

This study was focused on the people dimension of the IT flexibility measurement matrix in an effort to understand what leadership skills and characteristics are needed for successful flexible IT infrastructures. Building capabilities in the people dimension will enable organizations to reverse the trend of rising project failure rates through the improved leadership guidance of technical teams. The identified leadership skills and characteristics can then be included in the people dimension of the IT flexibility model as a component to formulating an equation for consistent IT flexibility measurement and implementation.

The purpose of this study was to identify those leadership characteristics that surface through scholarly research as legitimate factors to be included in the people

dimension of the IT flexibility measurement matrix. The identification of core people dimension components can then be combined with the other capability components and leveraged by organizations to regularly monitor and measure IT flexibility as it pertains to the organization being able to achieve its strategic goals. A discussion follows regarding existing literature in the realm of IT flexibility, IT equilibrium, and IT-business strategic alignment. I compared and contrasted prior research on these topics for this study. As related specifically to IT flexibility, existing literature does not define specific leadership characteristics as required to secure a flexible IT organization that successfully achieves IT and business strategic alignment.

Research Strategy

The Walden University Library and its database repositories were the primary tools used to gather resources for this research study. Initial resources were obtained through the use of the Thoreau and ProQuest Central repositories, which allowed for information gathering across multiple databases and multiple disciplines. With the goal of gaining more technical insight, I queried the Information Systems and Technology database search engines including the Association for Computing Machinery (ACM) Digital Library, the Institute of Electrical and Electronics Engineers (IEEE) Xplore Digital Library, and the Computer and Applied Sciences Complete repositories.

For additional information regarding IT project success and talent management strategies, I also analyzed the recent studies and insights of the Project Management Institute. The majority of the research documents considered for this study were within the years of 2005–2019. Earlier studies helped to lay the foundation for the concepts of

IT flexibility and provided significant insight into the evolution of IT infrastructures. One research article specifically related to IT flexibility and the IT equilibrium model (Ness & Chebrolu, 2013) was referenced given its direct relationship to the problem being pursued.

The following search terms were used to conduct research for this study: *information technology flexibility, information technology infrastructure, dynamic alignment, information technology leadership, leadership competencies, capability building,* and *talent management*. In addition to these full terms, the same searches were conducted using the *IT* acronym for information technology. The research also included compound searches using the logical delineators within the database search capabilities. The compound search terms were created through the combination of the various terms referenced above.

All of the search results were closely scrutinized, as not all information provided was relevant to the study at hand. Though most searches primarily yielded research studies, there were some references to articles that were not peer reviewed. Though these articles were reviewed to strengthen overall knowledge of the information available, many of these articles were not used or referenced for this research study.

Despite a vast array of search terms and utilizing multiple database engines, limited research was identified that specifically covered the topics of information technology and leadership together. Most results that specifically addressed anything about information technology and leadership approached it from the perspective of a niche environment such as collegiate scenarios or from the perspective of secondary

school principals. Several studies approached the leadership aspect from the perspective of user acceptance of information technology. Although more reference information specifically related to this combination of topics would have been beneficial, the lack of information readily available helped to solidify the gap in existing literature that was investigated further in this study.

Gap in Literature

As organizations seek to find a balance between the four dimensions of IT flexibility, there is a benefit to knowing which factors within that dimension would lead to potential success. An understanding of this information will allow organizations to focus their talent management strategies on strengthening capabilities that will be most beneficial. An IT flexibility measurement model exists (Ness & Chebrolu, 2013); however, specific factors have not been defined in each dimension to allow for consistent IT flexibility measurement. The matrix is based on the integration of the results of an IT flexibility study (Ness & Chebrolu, 2013) and the CMMI, which includes the people, process, technology, and tools constructs (Jones & Konrad, 2011). The results of this study addressed the gap in existing literature with respect to the people dimension of the IT flexibility model by providing understanding of the core leadership characteristics required to enable a successful and flexible IT environment.

The tools leveraged by an organization are based on the most applicable and capable technologies deemed appropriate for the organization to be successful. Each dimension of IT flexibility and how it is defined is also going to be specific to the organization; however, building capabilities in these core areas is a strategic priority for

companies (Benson-Armer, Otto, & Webster, 2015). Organizations may decide to spend more time building capabilities in one dimension versus another, but there must be a balance between all four to establish a core foundation for strategic stability.

Conceptual Framework

The conceptual frameworks used to address the research questions in this study were the IT-business equilibrium theoretical model of Ness and Chebrolu (2013), the empowerment theory as defined by Thomas and Velthouse (1990), the situational leadership theory (Hersey & Blanchard, 1969), and the complexity theory of leadership (Moerschell et al., 2013).

The rate by which an organization can return to a state of equilibrium from a state of disequilibrium due to shifts in IT capability or increased business demand is known as IT equilibrium (Ness & Chebrolu, 2013). The theory is based on several supporting theories including the economic concepts of supply and demand (Marshall, 1920), the crisis model theory (Monk, 1990), complex adaptive systems (Holland, 2006), and adaptive capacity and energy (Dhillon, 2006). In order for an organization to return to a state of equilibrium, many elements of a business must adapt to change to reach a point of stability. Once that common ground is reached, the approach by which to move forward is also adjusted appropriately.

The major concepts of the supporting theories provide the framework for IT-business equilibrium, which suggests that organizations will return to some state of equilibrium whether the shifts are ignited by sudden IT infrastructure changes or unexpected business demands. Ness and Chebrolu (2013) defined IT flexibility as a key

component to the IT-business equilibrium theoretical model, positioning IT flexibility as a key area of interest to determine how best to establish IT-business equilibrium effectively. As organizations strive to reach and maintain IT-business equilibrium, the fluctuations of several factors have to be considered including leadership (Moerschell et al., 2013), process (Hersey & Blanchard, 1969), and the organizational dependency on tools and processes.

The IT-business equilibrium theoretical model is a key starting point for extending research to further define the factors that generate IT flexibility. An organization's capacity for IT flexibility is defined by the concepts of modularity and connectivity (Ness & Chebrolu, 2013; Duncan, 1995; Ginsberg, 1984;). When combined with the IT management constructs of people, process, technology, and tools as defined in CMMI, a new research tool was revealed to guide deeper research into the tenets of IT flexibility.

The primary purpose of this research study was an investigation into the leadership characteristics that impact IT flexibility from within the people dimension of the IT management constructs. The empowerment theory as defined by Thomas and Velthouse (1990) suggested that human factors and the empowerment of individuals to make decisions is critical in business success. In addition, the transformational leadership theory of Burns (1979) determined that the use of charismatic and leadership tendencies that promote motivation are key to business success. To have a successfully flexible IT environment, combinations of leadership factors that encompass both theories are likely present in flexible IT environments. These conceptual approaches provided the structural

framework for the leadership characteristics to be identified as critical to IT flexibility, allowing for insight and alignment of those experienced leadership characteristics that influence IT flexibility.

Empowered individuals would have the liberty to make decisions that not only impact them personally but will also impact the outcome of a project or project team. Whether the decisions and characteristics exemplified are purely for personal gain or project success is hard to assess. However, the expectation is that empowered individuals would feel more responsible for the outcome of a project and would therefore make decisions in the best interest of the project (Thomas & Velthouse, 1990). When working with a team towards the common goal of a successful project, the personality traits on display have a significant impact on the decisions made and the potential success of the project (Burns, 1979). In the context of this study, those personality traits were manifested as leadership characteristics.

Teams self-manage or leverage empowerment to make decisions based on recognition of fluctuations in consumer behavior, acquired feedback, and organizational strategy. Studies have shown a direct correlation between the ability of an organization to be flexible and the management practices used (Byrd & Turner, 2000). The situational leadership theory (Hersey and Blanchard, 1969) indicated that balance between the task and relationship behavior of the leader and employee determines the appropriate leadership style for a situation.

The empowerment of employees to make the right decisions in a flexible IT environment would require leadership styles that support a low task relationship behavior

within the situational leadership model, which means the leader provides few directions. The way in which the leadership will support the team in making decisions must also be understood by all involved parties to be successful (Hersey and Blanchard, 1979). According to the theorists' investigations into managing by objective, there must be agreement as to how the leaders will manage the team as well, not just agreement on the goals to be met. As a result, this theory can be leveraged to confirm that the leadership practices identified as required to empower teams are also the same leadership characteristics required to enable a successfully flexible IT environment.

Business environments are complex and constantly changing and IT environments have to keep pace. Leadership skills also need to be adapted based on the situation at hand and past occurrences (Moerschell et al., 2013) to keep pace with the rapidly changing IT-business environment. Flexibility in IT environments is necessary to keep businesses aligned, effective, and continually moving forward. As a key component to IT flexibility, leadership skills must also be adaptable (Burns, 1979). The authors of the complexity change theory suggested that leadership has to change and evolve right along with the business environment (Moerschell et al., 2013). Leaders have to be prepared to adjust and make decisions based on the changing environment rather than rigid personal or traditional leadership tendencies.

The complexity change theory actually encompasses the ideals of the IT flexibility concepts and the IT-business equilibrium model. It is unlikely that one set of skills will be applicable to all business environments however understanding which leadership characteristics are consistently present will provide a baseline from which

organizations can build teams with high expectations of establishing and maintaining a highly flexible IT environment.

Information Technology and Business Alignment

As information technology continues to transform, organizations are actively seeking ways to become more agile to remain competitive. In seeking opportunities to become more agile organizations are looking to understand where synergies exist within their operations between IT strategic alignment and their ability to be agile. Both factors—IT strategic alignment and agility (or flexibility)—are increasingly being viewed as critical, coexisting organizational goals (Tallon & Pinsonneault, 2011; Renaud et al., 2016).

Numerous studies have found that alignment of the two impacts firms' bottom lines in various business metrics including profit, productivity, and revenue (Chan et al., 1997; Chan et al., 2006; Drnevich & Croson, 2013; Oh & Pinsonneault, 2007; Preston & Karahanna, 2009; Tallon, 2008). It has become imperative for organizations to gain a better understanding of the relationship and the underlying factors that drive it. According to Tallon (2008, 2009) and Jorfi et al. (2017), this understanding allowed for better allocation of IT resources to support strategic business needs and identify new business opportunities through IT capabilities.

Whether IT strategic alignment truly has a positive or negative impact on agility is still an unknown as studies have shown that it depends on many factors, including varying conditions of IT infrastructure flexibility (Tallon & Pinsonneault, 2011). Chebrolu and Ness (2013) concluded that smaller to medium IT organizations will gain

more through IT flexibility implementations than a financially focused strategic alignment effort to improve IT effectiveness. Quickly fading are the beliefs that IT cannot singularly create differentiation (Carr, 2003, 2004), however studies have demonstrated that IT infrastructures and the ability of leadership to leverage those environments are helping to drive business strategies and strengthen business results.

Luftman (2003) challenged us to more thoroughly investigate the IT and business alignment of organizations through the use of defined alignment categories and a methodology developed to assess specific attributes or practices within those alignment categories. To date, thousands of organizations have benchmarked themselves using the alignment categories and attributes developed by Luftman (2003). The results demonstrated that organizations are at different levels of IT-business alignment. However, understanding the existing state allows the organization to then focus the necessary strategic growth initiatives to reach full potential with regards to IT-business alignment.

Information Technology Flexibility

IT flexibility is the rapid deployment of technology components as enabled through a firm's existing technical and people base (Ness & Chebrolu, 2013). Tallon and Kraemer (2003) defined IT flexibility as the extent to which management can leverage procedures and processes to control the environment in which they operate. Byrd and Turner (2000) defined IT flexibility as the extent to which key IT resources can scale and adapt for different purposes.

All definitions alluded to the ability of organization to leverage skills and resources to demonstrate agility and effectiveness to complete projects. IT flexibility is emerging as a key resource to assist with alignment of business goals, strategy and business results (Jorfi et al., 2017). Croteau and Bergeron (2001) and Croteau et al. (2001) determined that IT flexibility is a dimension of IT strategy that is integrated into organizational IT alignment. The expectation is that the quicker an organization is able to adjust existing IT infrastructure to support a new business strategy, the more effective that organization will be in adapting to the changing environment (Tallon & Pinsonneault, 2011).

Being able to effectively and efficiently produce in a changing environment reflects agility. IT flexibility can also minimize costs through improved efficiency and enable organizations to seize new opportunities with ease through increased effectiveness (Drnevich & Croson, 2013). Incorporating agile methodologies into the IT infrastructure such as cloud adoption or IT service management practices, enables organizations to change direction quickly to capitalize on new opportunities by leveraging efficiencies through IT flexibility (Love & Ness, 2016). The effective management of such shifts and transitions not only requires organizations to maintain IT flexibility, but it requires the leadership to empower teams to make decisions and be accountable for the direction of projects.

Studies have also shown that IT strategic change can lead to situations where organizations may not be as flexible as desired due to IT bureaucracy and the rigidity and complexity of IT systems (Bharadwaj, 2000). Despite this perspective, research has

demonstrated that IT infrastructure flexibility is what will enable organizations to seize business opportunities identified to strengthen strategic alignment and increase organizational agility (Tallon & Pinsonneault, 2011). In the same research study, the authors discussed the moderating effects of IT flexibility indicating that an organization with strong IT flexibility capabilities enhances the alignment and agility relationship. In addition, the organization's IT flexibility capabilities may have the ability to decrease any negative effects of alignment on agility.

Hirschheim and Sabherwal (2001) and Sabherwal, Hirschheim, and Goles (2001) described similar findings in their study of dynamic alignment as the existence of IT flexibility enabled the firm to align the IT environment according to a revised strategy. The lack of a flexible IT operation did not enable organizations to adjust in a timely manner. Tallon (2008, 2009) also argued that having IT resources integrated as a part of the change management efforts enables firms to be more adaptable when responding to change. Additional studies also established a strong positive correlation between IT flexibility, IT effectiveness, and strategic alignment (Chebrolu & Ness, 2013; Jorfi et al., 2011) further solidifying the necessity of resilient IT environment and operations.

IT infrastructures can vary differently among organizations due to the hardware, software, operating systems, and networks that have been deployed and changed over time. Not only do physical resources impact IT infrastructure but also people resources who design, implement, and makes changes to these environments. The people resources also include the leadership personnel who oversee such operations. Ongoing transition in

all of these areas can make it difficult to establish and maintain a position of effective IT flexibility.

The ability of organizations to measure IT flexibility is still an unknown though researchers have defined the elements that comprise IT flexibility to be connectivity, compatibility, and modularity (Duncan, 1995; Ginsberg,1984; Tallon, 2009). The research of Isal, Pikarti, Hidayanto, Purtra (2016) concluded that the compatibility component of IT infrastructure flexibility and IT-business alignment were closely connected. This is a different finding than other researchers have surfaced, including that of Chung, Rainer, and Lewis (2003), which found the other three components of IT flexibility had more of an effect on IT-business alignment.

Jorfi et al. (2017) conducted an empirical analysis which found that the connectivity aspect of IT flexibility was a significant driver of strategic alignment. The same study also specifically stated that compatibility and modularity are not significant factors to strategic alignment, though there was a significant correlation with IT capability. The contrast in findings supports the position that IT flexibility is volatile depending on the environment and population, which leads to a compelling argument that a well-defined measurement for IT flexibility is needed.

Although there are many aspects to IT, the ability to establish IT flexibility is essential to ensuring an organization can consistently function through change and potential challenges (Chebrolu & Ness, 2013). The researchers also established an IT flexibility matrix as a baseline to investigate various factors that could have an impact on IT flexibility. The matrix is a combination of the constructs of IT flexibility –

connectivity, compatibility, and modularity - as well as the components defined in the CMMI tool – people, process, technology, and tools.

Information Technology-Business Equilibrium Theoretical Model

Studies have shown that there is a positive correlation between IT flexibility, IT strategic alignment, and IT effectiveness (Byrd & Turner, 2000; Chebrolu & Ness, 2013). Strategic alignment is the extent to which an organization's business strategy and information technology capabilities are able to work together to help produce positive business results. Given that business strategies may change due to consumer and market demand, IT capabilities are also to be in a constant state of transition. IT organizations have to be able to adapt quickly to changing demands and establish a point of equilibrium through successful change management processes. This provides a stability point for the organization to move forward with the strategic plan in place. This requires successful IT project transitions, implementations, and growth ventures to ensure organizational success.

The demand of business strategy initiatives and the supply of IT capabilities to support such strategies intersect at some point to determine IT and business equilibrium (Ness & Chebrolu, 2013). The intersection of IT and business strategy represent a point at which organizations can be most effective as all IT resources and the necessary alterations are working in synchronization with the goals of the business (Figure 1). It is supporting the business while at the same time the business is able to advance in a positive direction based on its reliance on the IT environment. If IT initiatives and subsequent IT stability becomes an issue, then it becomes more difficult for the

organization to progress with strategic initiatives.

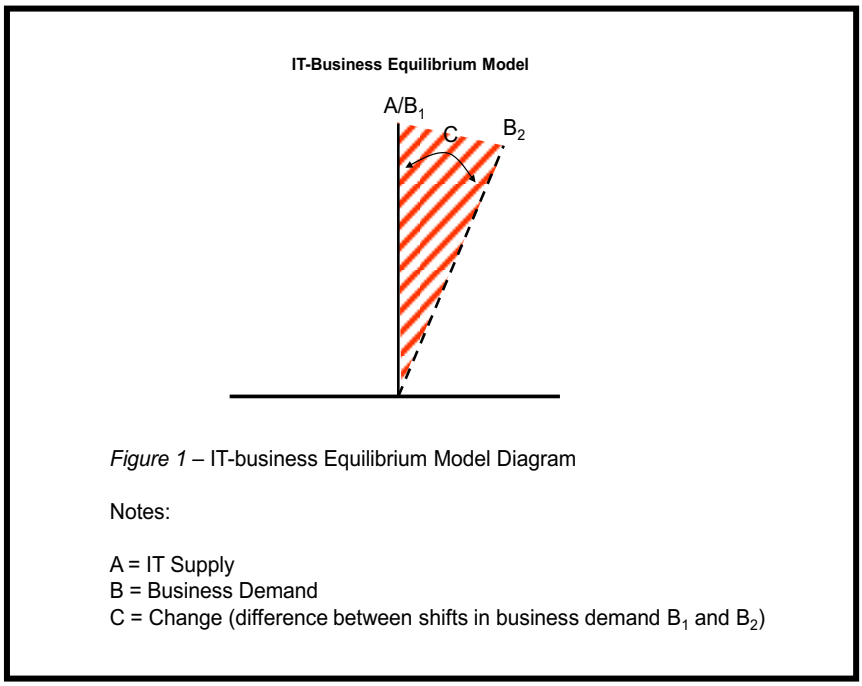

Figure 1. Information technology-business equilibrium model. From "The IT-Business Equilibrium Model: Understanding the Dynamics Between Business Demand and IT Supply," by L. Ness and S. B. Chebrolu, 2013, *International Journal of Applied Management and Technology, 12,* p. 33. Copyright 2013 by the International Journal of Applied Management & Technology.

A rapid shift in business strategy or an increase in the demand on the IT infrastructure can result in a state of IT disequilibrium putting organizational goals and initiatives at risk. Improper alignment can impact sales, profit, growth, and reputation among other key business elements (Tallon & Pinsonneault, 2011). The ability or inability of organizations to recover from a state of disequilibrium is defined as the level of IT flexibility (Ness & Chebrolu, 2013). Organizations capable of quickly eliminating the gap created from a shift in IT capability or the increased demand of business strategy are considered highly flexible IT organizations. Those that struggle with such shifts in

supply and demand or choose to ignore it as if a relationship does not exist, are putting the overall business at risk.

Measuring Information Technology Flexibility

The ability to measure IT flexibility is still unknown. Researchers have determined that IT flexibility can have a significant impact on business strategy and alignment (Byrd & Turner, 2000; Chebrolu & Ness, 2013; Tallon & Kraemer, 2003). However, there is still limited scholarly knowledge concerning how to measure if organizations truly have flexible IT infrastructures.

In physical terms, IT infrastructures include hardware and software networks that function together as a system to support an organization's needs. Whether backing up data, pushing information to customers, facilitating external customer inquiries or analyzing customer data IT infrastructures are complex environments. Despite the ultimate purpose of the IT environment and the overarching goals of the business, Duncan (1995) and Ginsberg (1984) identified the constructs of connectivity, compatibility, and modularity as IT features that must be demonstrated by an IT environment in order to be considered a flexible IT environment.

Connectivity, also referenced in the literature as scalability (Tallon & Pinsonneault, 2011), represents the ability of an organization to dynamically adjust its size to meet changing business demands. If the physical assets of an IT infrastructure are difficult to maintain, update, and move as needed then the IT environment will likely not meet the qualification as being flexible. New networking strategies such as cloud computing (Chebrolu & Ness, 2013) and software-as-a-service initiatives (Love & Ness,

2016) require organizations to have connectivity to be able to build to business specifications as quickly as possible. If the capability is not there in existing IT environments, then the organization will likely struggle to branch out beyond existing projects.

Croteau et al. (2001) used similar terminology when they defined IT infrastructure and concluded that the elements of user involvement, connectivity, distributed computing, flexibility, and IT awareness must be assessed together to qualify an IT infrastructure. The distributed computing terminology could be best correlated to modularity (Ginsberg, 1984; Duncan, 1995) which is defined as the ability of an IT infrastructure to leverage and use varying components including servers, network devices, and operating systems platforms. Adaptability (Tallon & Pinsonneault, 2011) is another term used in existing literature that is congruent with modularity and it is referred to as the ability of the IT infrastructure to support the IT needs of an organization. Those IT needs could be internal from the perspective of hardware and software interoperability; however they could also be the ability of the IT organization to leverage existing resources quickly to help a new function of the business while the existing business continues.

User involvement and IT awareness (Croteau et al., 2001) can be best correlated to compatibility (Ginsberg, 1984; Duncan, 1995) as both factors have a direct impact on how usable an IT environment can be. IT infrastructures must be compatible from a systems design and a user design perspective. IT environments with aged components and one-to-one or “point” relationships between components are not usable or beneficial

to an organization in the long term. From a systems design perspective, components should be easily compatible with other appropriate components throughout its lifecycle. From a user design perspective, compatibility indicates that the IT system must be easy to use. Internal and external end users must be able to easily manipulate, manage, and effectively use the IT infrastructure environment.

Flexibility was considered a variable in the Croteau et al. (2001) study whereas different terms were used to define flexibility in other studies (Chebrolu & Ness, 2013; Duncan, 1995; Ginsberg, 1984; Tallon & Kremer, 2003). Flexibility is a key factor for consideration when investigating the impact flexibility has on IT infrastructures, organizational alignment, and performance (Chebrolu & Ness, 2013; Croteau et al., 2001; Tallon & Pinsonneault, 2011). There still exists a gap in existing literature to understand the underlying factors that make up IT flexibility. A compatibility matrix has been proposed to further investigate IT flexibility (Figure 2).

	People	**Process**	**Technology**	**Tools**
Modularity				
Connectivity				
Compatibility				

Figure 2. Information technology flexibility measurement matrix. From "The IT-Business Equilibrium Model: Understanding the Dynamics Between Business Demand and IT Supply," by L. Ness and S. B. Chebrolu, 2013, *International Journal of Applied Management and Technology, 12,* p. 34. Copyright 2013 by the International Journal of Applied Management & Technology.

The matrix is based on the integration of the results of an IT flexibility study (Ness & Chebrolu, 2013) and the capability maturity model integration tool which includes the people, process, technology, and tools constructs. By determining the specific skills, traits, or values for each of the matrix cells that are common in successful flexible IT environment, a formula could then be generated to provide organizations with a consistent way to measure IT flexibility. Each element entered into the matrix would be measured and weighted within an IT flexibility measurement formula. Prior to this research study, no characteristics had been defined to insert into the various cells, likewise a comprehensive method for measuring and weighing each element has not been defined.

The CMMI tool is a process model through which businesses can be more effective through the identification and support of behaviors that will lead to better performance and more promising business results. The constructs provided are measurable entities that can be changed and adapted depending on the culture and desired results of the organization. Technology projects are successful based on whether they are able to meet cost, schedule, and quality demands. The creators of the CMMI concluded that a focus on the actual processes used based on the combination of people, process, tools, and technology are the cornerstones to meeting cost, schedule, and quality demands and commitments. The establishment of a process model will assist in ensuring projects are successful while also producing a model that can be used for future project endeavors.

The components of CCMI have also been adapted into what are known as IT capabilities (Jorfi et al., 2017; Zhang, Li, Ziegelmayer, 2009). In the Jorfi et al. (2017)

study, an empirical analysis was conducted to determine if the components of IT flexibility had a positive effect on the components of IT capability. In this particular study, the IT capability components were defined as IT infrastructure, IT architecture, IT relationship resources, and IT human resources.

The researchers found that all had an effect on strategic alignment, except IT architecture. Regarding the relationship with between IT capability and IT flexibility dimensions, it was concluded that the IT flexibility components of compatibility and modularity had an effect on IT capability. Although this particular study did not result in an effect from connectivity, those results could have been due to the population used in the Jorfi et al. (2017) study and therefore does not eliminate connectivity as a factor to be considered by leadership when working to establish and maintain flexible IT environments.

Information Technology Leadership

The IT capabilities of an organization have the ability to impact a firm's business success and strategic plan for future growth and stability (Chan et al., 1997; Chan et al., 2006; Drnevich & Croson, 2013; Oh & Pinsonneault, 2007; Preston & Karahanna, 2009; Tallon, 2008). This requires an IT strategy that has to be thoroughly developed, effectively communicated with the business components of an organization, and ultimately implemented. Furthermore, in order for an IT organization to become established and maintain criteria to be considered a flexible IT environment, there is a team of individuals guiding the ongoing decisions that encompass the IT strategy. This

leadership team could include everyone from the systems' administrators to the vice president of technology as they all play a key role in an organization's IT success.

Technical skills seem the most applicable for team members within an IT organization, however given the strong interlock between IT and business organizations there are potentially innumerable skills that are needed by IT team members depending on their actual role within the organization. Whether the skills needed for success are more technical or even being more globally aware (Bücker & Poutsma, 2009), IT leadership should be enabled and motivated to grow, leverage, and share those skills so there is no disruption to the IT service provided and no disruption to the overall strategy. If leadership teams are not motivated or empowered to make decisions that may impact the future direction of the IT environment, then those individuals are not positioned to impact the potential stabilization and growth of the organization (Thomas & Velthouse, 1990).

Instead of focusing on specific skills, Luftman (2003) defined skills maturity as all human IT resource considerations. He goes on to define skills maturity as a key category for assessing IT and business alignment, therefore exposing a critical area of the IT business that has to be understood and leveraged appropriately. Hoving (2007) emphasized that the ability of IT leadership to provide business value is imperative for ongoing success of a leadership team and the IT business. Providing business value occurs by not only ensuring the day-to-day effort is done to keep the IT systems running, but by harnessing the technology and having a solid understanding of the overall business. IT leadership has the responsibility to make suggestions and listen to

suggestions regarding future direction in order to establish and maintain a flexible IT environment.

The construct of IT flexibility has also been defined as including human IT factors but those have not been defined to fully understand which human factors have the most impact on IT flexibility. The IT flexibility compatibility matrix (Ness & Chebrolu, 2013) presents a framework by which the people dimension of IT flexibility can be further investigated with respect to modularity, connectivity, and compatibility to identify key leadership factors that have an impact on IT flexibility.

Strategic Talent Management

The employees are the backbone of many organizations worldwide. From the initial foresight to start a business, to the suggestion to move into a new market, to the ways to the implement underlying technologies, there are millions of employees around the world who play a significant role in ensuring organizations remain productive. As companies have become more aware of this truth there has been an increased focus on ensuring the right employees are identified to complete the objectives of any given position.

Recruitment efforts are critical and thorough, as organizations desire to bring in individuals who would have long-term success within their organization. In addition, there is also an increased focus on managing that talent once onboard with the organization. No longer is it common for employees to stay with one organization for a full 25 to 30-year career. Therefore organizations must invest in proactive efforts to

develop and retain productive talent, while earning maximum return on investments from employees while on board.

As a key part to overall business strategy, talent management must also be in alignment for an organization to achieve and maintain stability. Strategic business alignment requires genuine consideration of the employee base and the talent on board or being on boarded to carry out the defined mission. The ability to establish and sustain a flexible IT environment in alignment with business strategy is also dependent on the quality and implementation of the strategic talent management strategy (PMI & HSI, 2014). Employees not only must be capable of applying relevant skill, but they also must be willing to develop and grow themselves as individuals. It is the leadership team's responsibility to cultivate these skills and ensure that employees are motivated to work hard and be productive. Not only are the strategic talent management efforts important as they apply to the general team, but these are skills seemingly more necessary for active leadership.

Within the people dimension of the IT flexibility measurement module there are an infinite number of skills that could be applied as factors into an organization's IT flexibility level. The flexibility level of an organization will be specific to the leadership within that organization and the teams implementing the established technical strategy. If common leadership skills are identified as critical factors to an IT projects success or failure, then that information can be leveraged or excluded in an eventual formula to measure the IT flexibility level of a given organization or within a project area.

By understanding leadership skills critical to the success of flexible IT environments, talent management groups can then solicit employees who possess the skills needed for the organization to be successful. The expectation is that these employees would be more productive and willing to develop their skills in a manner conducive to maintaining personal, team, and project success. If team members are brought in who are known to have an affinity for the job to be done and furthermore there is a skills match, any transitions within that team will be more easily managed (Rath, 2007). In addition the employees will likely stay engaged and have a personal investment in the work to be done to maintain a flexible IT environment.

Transformational Leadership

In order to positively affect change within organizations leaders must have a business understanding to determine what changes are needed and more importantly, when they are needed. Depending on the size and external influence of an organization, the act of implementing any kind of change internally could have a detrimental effect externally if not managed correctly. Customers could become discouraged thus affecting future business and employees could become discouraged which could have a significant impact on not only the proposed changes but also the productivity of the corporation.

Though some organizations still function such that a few people make all the significant decisions and impose changes as they see fit, in most cases the days are gone where such changes can be successful. Especially in larger organizations, it is necessary to consider all stakeholders when implementing changes. Likewise, many levels of

leadership must be involved to ensure the necessary changes are fully implemented throughout an organization.

The ability of leaders to positively affect organizations, people, and social systems is critical to implementing positive change. Appealing not only to the tactical efforts to be accomplished but fueling a common motivation to be productive and successful (Burns, 1979), leaders must ensure they have a connection with their teams in order to see positive business results. They must have the ability to understand all stakeholders, identify potential areas for change, and implement them successfully with minimal risk to any stakeholder. The effective use of transformational leadership will also encourage strength in teams and develop business skills in other employees (Andressen, Konradt, & Neck, 2011; Harms & Credé, 2010).

Transformational leadership requires leading by example and trying to determine which leadership practices will be the most beneficial to the team. All teams are different and may draw motivation from different experiences, so leaders have to be mindful when working to build and establish a team. The actions needed to influence positive organizational change likely differ from organization to organization due to differences in business goals, culture of the organization, business models, and employee interactions. However these are all elements that leaders, especially transformational leaders, must thoroughly understand in order to be able to establish the proper balance among them in order to positively influence change.

Transformational leaders have to not only focus on building personal skill, but that self-development must also translate into the development of the larger team.

Understanding the business but also keeping the team engaged is important for ensuring that acceptable efficiency is attainable and strategic business goals are being met. Specific to flexible IT environments, given the changing state of business demands, leadership as well as team members must be engaged and have the ability to respond to stimuli in a timely manner. The leadership sets the example, and the personality of a team often mimics that of its leader.

Building capability into an organization within the people dimension of the IT flexibility model will require transformational leadership that is able to focus on the strengths of the team. So often the focus revolves around what individuals do not do well, but there are benefits to building teams where the strengths are aligned with the needs of the team, in advance. Gallup research scientists found that when given the opportunity to work in areas that focus on their strengths, people are "six times as likely to be engaged in their job" (Rath, 2007). Within flexible IT environments, employee engagement is key to the team being able to see and react to changes in the environment. Identifying leadership that can nurture such skills within themselves and employees will help towards the accomplishment of IT effectiveness and strategic business alignment goals.

Change and Organizational Performance

The need for change is often due to attempts to improve organizational performance. Whether the need is to be more streamlined in overall business efforts, develop more internal leadership, or provide a solution in a timelier manner, how the strategies are implemented to accomplish these goals will have a direct impact on organizational performance. Most studies about strategic change management initiatives

investigated why change is so often resisted. Numerous theories have been identified, but it is common knowledge and human nature that most people fear and will resist what they do not understand.

Choi and Ruona (2011) investigated what is required to prepare an organization for change and the structures that should be in place such as effective human resource managers as well as transformational leadership at the team level. In order to identify and implement any level of change within an organization, there must be strong leaders who are able to positively influence those around them, particularly those staff members who will be most affected by the change. These individuals could be human resource managers or executives, however more often than not these individuals are the middle managers who are directly responsible for the mission of the teams they lead.

As a result, leadership must understand how to positively introduce, affect, and manage change scenarios to completion. The ability to do this effectively requires the expertise and influence of a transformational leader. If the larger team does not buy-in to the change initiative, then there is great possibility that the change will be unsuccessful.

When changes are implemented within an organization it is important that buy-in is obtained from the employees. This concurrence that the proposed change is beneficial and necessary often takes time to develop (Choi & Ruona, 2011). As a result, it is important that leadership considers how to best introduce proposals for change (Moerschell et al., 2013) and that time is allowed for everyone to agree and understand their role in the process. If this does not occur then organizational performance can be impacted in various ways. Employees could resist the change and the proposal could

become a distraction to getting work done under either the old or new methods; negative sentiments could be developed that could spill over to customers or even cause workforce attrition.

If organizational change is implemented in an undesirable manner, then the intent of the change could be missed and it could also destroy an organization. Within organizations, the primary tool to prevent such destruction from organizational change initiatives is communication (Kupritz & Cowell, 2011). When the lines of communication are open concerning the changes to be implemented, it will allow others to share concerns and ultimately agree with the plans. Allowing employees to share concerns is a step in the organizational change process that is often times overlooked which can result in employee resistance to the change.

By leveraging the relationship established by transformation leaders with the employees and allowing at least a subset of the team to participate in the decision making process, issues and concerns can be identified and addressed early. Moreover, the mere act of including a subset of the employees in the discussion will likely cause the larger pool of employees who were not directly included to be more confident in the plans because they know their peers were involved. In order to facilitate effective organizational change, sometimes it is a matter of managing the various perspectives and ensuring that all those involved have good reasons to be confident in the proposed changes. If roadblocks to change are eliminated early, then it gives employees fewer items for concern and shows the commitment of the leadership to assist in the process.

Change and Organizational Transformation

Change management implementations also have the ability to transform teams by enabling them to be more efficient and productive. In order to accomplish such a goal, the proposed changes must be introduced and implemented with the best interest of the larger team in mind, not just the final business results. When leadership builds a strong relationship with the team, it can be easier to gain consensus for proposed change strategies (Burns, 1979). According to Borgogni, Dello Russo, and Latham (2011), employee perception of top management and how change is affected also had an impact on the employees' self-efficacy.

When employees have confidence in their leadership they are more willing to entertain suggestions for change and follow the necessary procedures to implement the proposal. When a negative relationship exists or if no relationship exists at all, then the likelihood for resistance increases because the vital characteristic of trust is missing. By establishing and nurturing relationships, the employees will feel that the leadership is keeping their best interests in mind.

In the same study, the authors concluded that individual employee self-efficacy also positively correlated to group self-efficacy (Borgogni, Dello Russo, & Latham, 2011). If a small team is able to establish positive relationships and skills that ultimately lead to positive change implementations, then those good sentiments and examples will likely influence the larger group and even the larger organization. By ensuring that leadership and employees work well together, there will be fewer internal conflicts of

interest and the larger teams will be able to work more effectively together to further the goals of the organization.

When employees are highly efficient and have some flexibility when it comes to how to perform their jobs (Thomas & Velthouse, 1990), they were more likely to embrace a change that would continue to bring such freedoms. The implementation of certain changes can help the overall organization become more efficient and self-sufficient, but it is all based on the establishment of an existing positive relationship between top management and employees. Fugate, Harrison, and Kinicki (2011) conducted a study of appraisal theory and its relationship to organizational change. Similar to Borgogni et al. (2011), they concluded that a history of negative appraisals and feedback would lead to negative perceptions of organizational change.

Though negative appraisals at times may be needed, leaders have to ensure that it is not the normal operation of business if they expect employees to accept and implement potential change in the future. If employees only ever receive negative feedback and have a negative relationship with management, then they are less likely to buy into future decisions. Leaders have to be sure to establish and maintain professionally appropriate relationship with employees and to present themselves as transformational leaders at all times.

Summary

This chapter highlighted literature that demonstrated the critical relationship between IT infrastructure, business strategy, and IT effectiveness. As organizations seek to become more agile in order to respond to business demands, it is necessary that

organizations are able to exemplify IT flexibility characteristics that will allow the appropriate adjustments to occur when needed. One conclusion from the literature review is that understanding the IT-business equilibrium model and the supply and demand relationship that exists between IT capabilities and business strategy will enable organizational leadership to proactively manage the business to a state of maximum effectiveness. The IT and business branches of an organization fully complement one another if managed successfully.

The literature related to strategic talent management, transformational leadership, organizational change and performance were also analyzed in this chapter as each concept provided insight into leadership skills and approaches that may be ideal for flexible IT environments. The characteristics identified through this study are skills and traits that coincide with requirements for successful transformational leadership. Organizational change and the resulting performance due to change is the responsibility of the leadership team to understand and manage. Therefore, relevant to this study leaders and team members in flexible IT environments must have the skill and ability to respond quickly to rapidly changing business environments.

Although the benefits of IT flexibility are apparent, the literature also clarified that there is really no clear way to measure IT flexibility today. Researchers have identified the components of IT flexibility to be modularity, connectivity, and compatibility but a means to truly measure and compare these constructs is not available. As a result, it is likely that organizations struggle to understand and identify with the IT

flexibility concepts and ultimately miss IT and business opportunities for continued growth and development.

The underlying concepts of the IT-business equilibrium model (Ness & Chebrolu, 2013) coupled with the IT flexibility compatibility matrix provides the foundation for additional investigation into the specific factors that impact IT flexibility. The CMMI process dimensions of people, process, technology, and tools represent four categories through which the IT flexibility components of compatibility, connectivity, and modularity are further explored.

The next chapter presents a research design for specifically determining the leadership factors that impact IT flexibility within the people dimension of the CMMI model and IT flexibility compatibility matrix. An essential assumption of this study was that IT human resource considerations are just as critical to a firm's IT flexibility capability as the technology and business goals involved (Luftman, 2003). The human element of IT is an inevitable component, however rarely discussed in existing literature. As processes are established to improve an organization's capabilities the people element is a critical component. The following chapter details the research design and methodology implemented to determine the leadership factors that impact IT flexibility including the rationale for qualitative research to be conducted.

Chapter 3: Research Method

The purpose of this case study analysis was to discover if there were common leadership characteristics that could be utilized as components to the IT flexibility model (Ness & Chebrolu, 2013). I used the qualitative study to investigate the leadership characteristics used in the implementation of various IT projects. The goal was to gain insights from IT projects that had been both successful and ineffective. Leadership characteristics that were consistently present in successful projects and consistently missing from ineffective projects were of considerable interest. Once common leadership factors were identified, that information could then be used as input to the IT flexibility measurement model (Ness & Chebrolu, 2013) and organizations would be able to use this information when establishing and building successful project teams.

The leadership component of the IT flexibility model can be leveraged to identify talent at various levels of the technical organization, from a functional leadership perspective to the technical employees needed to handle the day-to-day aspects of a project. The overall goal of this study was to increase IT project success and IT effectiveness through improved and consistent IT flexibility. Identifying and applying the appropriate leadership factors to the IT flexibility model may enable organizations to better achieve a desired level of IT flexibility.

Chapter 3 covers the details of the research design and methodology as outlined for this study. This includes a discussion of the role of the researcher as well as the concepts of bias and how they are handled. In addition, ethics and trustworthiness are

discussed as related to the data collection process and the reliability of the data obtained and analyzed.

Research Design and Rationale

The central research question for the study was: What leadership characteristics are needed in a flexible IT environment? The following research questions were developed to guide the qualitative case study investigation.

RQ1: What are the leadership characteristics exhibited by IT organizational leadership to establish a flexible IT environment?

RQ2: What are the leadership characteristics exhibited by IT project team members to maintain a flexible IT environment?

The central focus of this study was the leadership characteristics that are present in flexible IT environments, specifically, which leadership characteristics are consistent, prevalent, and ultimately lead to the implementation and maintenance of the flexible IT environment. The goal of conducting qualitative research is to explore and understand the perception of individuals (Yin, 2014). In this study, the goal was to understand the perception of 20 IT professionals with respect to leadership characteristics in IT flexibility environments. By gaining an understanding of the leadership experiences and perceptions of individuals in flexible IT work environments, common leadership characteristics were identified that are essential for future and current employees.

The identified leadership characteristics can also be presented as input to the IT flexibility measurement model (Ness & Chebrolu, 2013). By employing resources who demonstrate the identified leadership characteristics as well as the IT flexibility

measurement model, organizations can strive to achieve improved IT project success and strengthen their IT and business strategic alignment. Having the foresight to build teams with the leadership characteristics and capabilities needed to sustain IT flexibility may make organizations more efficient and enable leadership to programmatically build teams for the future. Not only will doing so help organizations realize improved IT project success rates, but it will also enable a more stable growth based work environment.

I used the qualitative research methodology to identify common leadership characteristics in flexible IT environments. I used a multiple case study research design, and each case involved a study participant and the experiences they had from working in flexible IT environments. Each participant provided feedback on leadership characteristics they found to be prevalent in successful IT projects as well as ineffective IT projects. The selected design method also enabled exploration into the views and perceptions of the individual participants. Their experiences were compared to determine common leadership characteristics for successful IT project implementation. A benefit of the case study design is the real life context of the feedback received as it was based on the experiences of the participants.

I considered the phenomenological design approach; however, it was deemed less effective for the purpose of this study given that one shared experience or phenomenon was not being studied. Instead, the element to be understood further in this study was the participants' observations and perceptions of leadership characteristics during any number of experiences. Although this study benefitted from understanding the actual experiences of the study participants, the element to be investigated was not the

experience itself. The combined feedback from various participants provided the necessary focus to conceptually assess the situation. Each person identified to participate in the study was considered a case for data gathering and analysis purposes.

A mixed methodology study was also considered in order to conduct a correlation analysis regarding which leadership characteristic have the strongest relationship to IT project success. However, I determined the extent of this study would be to identify the common leadership characteristics that could be leveraged in the IT flexibility measurement model. There was no correlation analysis as each characteristic identified could be leveraged in the larger IT flexibility measurement model with other factors. Determining which leadership factors correlate most closely to IT flexibility in general will remain as a potential future study to be discussed in the upcoming chapters.

Role of the Researcher

In this research study, I was in the role of an observer and participant (see Appendix A). The research design called for interviews that required direct participant engagement. I also functioned as an observer, being physically in the interview and providing close attention to any cues given by the participants as they proceeded with answering the research questions and providing their insight.

I conducted the research for this study by identifying 20 IT professionals from a single large IT organization. The plan was to receive approval from multiple companies to potentially interview their employees. If there were challenges with the initial IT organization of choice, or if the preferred company declined, then one of the secondary

companies would be used to ensure the proper number of participants were included for data saturation purposes.

I addressed researcher bias by ensuring that the study participants were not in any way affiliated with IT projects for which I was responsible. This also eliminated any conflicts of interest and helped ensure participants were comfortable with their decision to participate. Given that I have experience working with IT project implementations, the findings of the study were generated purely from the information provided by the participants. I was completely comfortable with and committed to leaving out personal opinions and experiences during this process. To prevent conflicts of interest and to maintain the integrity of the study, participants' names, organization affiliation, or any other personal information were not shared in the study. That information was only gathered to screen potential participants and was maintained confidentially.

Methodology

A multiple case study research design was the qualitative research method that I used in this study. The population from which the sample was taken consisted of 20 IT professionals from a single organization that produces a suite of IT solutions and delivers IT services. The IT professionals selected were not in the traditional leadership hierarchy of the organization, so they were not the managers or supervisors. Instead the IT professionals selected for this study were those who worked for those supervisors and managers. Given the diversity of IT solutions and services provided, the partner organization employs potential candidates throughout the product development cycle

from initial concept design all the way to deployment of the product or service. As such, a variety of perspectives and opinions were obtained from this sample population.

Purposive random sampling was used to select the study participants. The sample population had a wide array of experiences in both successful and unsuccessful projects that allowed them to provide unfiltered information for the purpose of this study. Despite being obtained from one organization, the data gathered and the results identified are not applicable to that organization only. The diversity of the partnering IT organization and the wide array of employee roles and employee experiences enables the data and subsequent results to be applicable to a variety of organizations including non-IT based organization that have IT departments.

I identified 20 IT professionals to participate in the qualitative multiple case study. Each of the 20 participants were considered an individual case and the results gathered through the semistructured opened ended interview questions (see Appendix B) were compared and contrasted to find common themes. Based on the interview protocol developed, the interviews resulted in a significant amount of data that led to common leadership characteristics that could then be applied to the leadership component of the IT flexibility measurement model. The varied IT backgrounds on different products, services, and at different stages of the product development cycle allowed the participants to provide unique perspectives to help determine the key leadership factors that impact IT flexibility.

Using purposive random sampling to ensure diversity in participant experiences also ensured that any similarity in responses would be due to a natural need for certain

leadership characteristics for successful project delivery. The goal was to eliminate the potential of similarity in responses due to common work experiences and deliverables. Accordingly, the participants were solicited from multiple functional areas and the process of selecting candidates included confirmation that their experiences prior to their current team were also diversified.

In order to identify participants from within the selected IT company, I obtained approval from highest ranking local official of the IT company via a signed letter of consent. Once approval was obtained, I requested the e-mail addresses of the entire IT organization to solicit participation, providing a background of the proposed study and qualification for participation. The letter of invitation and consent forms were sent to all e-mail addresses provided. Those interested in participating were asked to respond with their consent to participate.

The process yielded more than 20 participants, but it was assumed that not all employees would be interested in participating. Those who responded with their consent to participate were scheduled for a 30 minute interview within 2 weeks of their response. The interviews were conducted at the participants' convenience on-site at the local organization. I obtained agreement to conduct the interviews via a signed letter of consent.

By soliciting participants from a local IT organization, in person interviews were requested and preferred. An interview protocol was developed to be used as the primary instrumentation tool (see Appendix B). Within this protocol, semistructured open ended questions were used as the roadmap for the interviews. A second set of interview

questions were designed to gain more insight into the employees work history (see Appendix B). A recap of the purpose and problem being investigated in the study were shared with the participants to ensure all facets were understood, likewise the confidentiality agreement was reiterated. All of the above inquiries and explanations helped the participant to relax and feel more comfortable with the overall interview process.

The primary set of interview questions (see Appendix B) tied directly into the research questions. The interview process helped pull out the insights from the participants as the interview protocol questions were used as a guideline. Depending on the responses provided, additional probing questions were inserted to help the participants further elaborate on their answers. The interview protocol ended with summary questions and asking the participants if they had any additional information they would like to provide for the study or if they had any questions.

In addition to the interview protocol, audio recordings of each interview were conducted. The participants were made aware of the use of audio recording technology in the letter of consent and if they indicated a desire not to be recorded then they were not selected to continue with the process. The purpose of the audio recordings were to ensure that accurate data was being collected for the data analysis process. Inevitably things could have been missed during the live interview, as I was responsible for delivering the interview questions and recording the results simultaneously.

Though notes were taken during the actual interview, the availability of the audio recording allowed for a deeper analysis, clarity, and eliminated the possibility of bias or

misinformation. The use of this combination of data collection instrumentation ensured the research questions were effectively addressed. The availability of the recordings allowed for a deeper analysis of the responses provided by the participants, strengthening the validity and reliability of the data collected.

Once an individual interview was completed, each participant was reminded of the actions being taken to ensure that their feedback remained confidential. They were also reminded of the purpose and goals set for the study as well as the plan for categorizing their feedback with other participants in an effort to identify common leadership characteristics. Though there was no requirement for a follow up interview, the participants were asked if they would be willing to be contacted again for follow up or clarification of their responses, if needed.

The data collected was analyzed through the use of the NVivo software for qualitative research. Initially the data gathered was in the form of notes taken during the interview and playback of the recordings. At this stage, the responses were tied directly to the research questions as developed in the interview protocol so the data would have a distinct connection to the research question. This information was then coded and categorized based on common leadership characteristic themes that were mentioned throughout the various interviews. The coding took place within the NVivo software program in order to use the capability of the software to identify connections and patterns in the data.

There was some data gathered from the interviews that did not seem related to other common characteristics. Consideration was given to whether the discrepant cases

had some relationship to each other thus establishing a unique characteristic or category for investigation. In some situations a discrepant case or definition did truly refer back to a larger category, however terminology or the context in which the feedback was provided was slightly different. If there was confusion or clarification was needed then a follow up conversation with the study participant was planned to ensure accurate inclusion of the data.

Trustworthiness

Internal and External Validity

Qualitative credibility was established through the use of the triangulation strategy. Triangulation occurred through the data analysis and coding of the information gathered from the interview participants. In addition, the observations from the interviews were analyzed concurrently with the information shared by the participants. The ability to confirm that similar data were obtained from the various participants further indicated the credibility of the data. The presentation and discussion of any outlying themes identified also helped to strengthen the validity of the study.

Leveraging the data saturation strategy and ensuring there was variation during participant selection established the external validity of the study. The sample size selected for this study was 20 participants and those participants were randomly selected based on their willingness to participate. Outside of the specific interview questions to ensure the participants had experience in a flexible IT environment, the participants' backgrounds and experiences were indeed diverse.

The logic behind this selection process was to ensure there was adequate data saturation through the involvement of a diverse sample of participants. Given that job roles and experiences were different, any common themes gathered from the data collected inherently contained greater credibility. The transferability of the data to a larger population was also solidified through this participant selection process. The similarities among responses and experiences despite the various work histories of the participants suggested that the findings could be applied to a larger population.

Dependability and Confirmability

As the data for the study was analyzed the hope was that common themes would be identified despite the diverse backgrounds of the study participants. The dependability of these themes was verified through the use of triangulation during data analysis. In addition, the ability of the identified themes to be extrapolated to larger populations and applied to various IT flexibility leadership environments also speaks volumes to the dependability of the data presented.

The confirmability of the data was secured through the reliance on the information provided by and gathered from the study participants. My opinion nor perspective were included in the data analysis portion of the study. The results presented were purely based on the feedback received during the interview process from the study participants.

Ethical Procedures

The identification and selection of study participants remained within appropriate ethical boundaries and standards. Keeping an ethical focus throughout the study

development and implementation ensured that the study participants were willing and comfortable with participation. Likewise, the study was not jeopardized in any way by not keeping ethical standards in mind. The Walden University Institutional Research Board (IRB) was fully versed on the plans for identifying and utilizing participant information and the study did not proceed until the appropriate approvals were obtained. The IRB approval number obtained before conducting the research is 12-14-18-0079055.

Recruitment

No specific ethical concerns related to recruitment were identified. All information gathered from the participants was handled in a confidential manner to ensure names, employment history, or any other sensitive personal information was not communicated beyond the research study. Likewise, only information that was needed to determine if the potential candidate was an adequate participant for the study was requested. For example, a potential participants' social security number or home address was irrelevant to the study, so such information was not requested.

A single IT company was used to gain study participants. Permission was received from the senior leadership team; once obtained the email addresses of the entire IT organization were requested with the hopes that a minimum of 20 responded to allow the study to continue. If 20 participants were not received, the search would have been expanded by soliciting additional project teams within the same IT company. If enough participants were not identified within the single organization, then the same participant selection process would have been used with a second, backup organization.

Data Collection

All data collected were handled in a confidential and secure manner. Once participants were selected and interviews were conducted, their specific study results were coded anonymously, and the data were analyzed in that manner. This ensured that there were no unnecessary relationships established because the data were collected from one participant versus another. When the results were summarized and provided for review no names or personal descriptors were used that could allow the participants to be identified.

No one had access to the data gathered except me. The coded data were stored on my local hard drive as well as multiple backup devices that only I had access to. All hard drives and backup devices were password protected. Raw data was not disseminated at any time and all data summarized in the results were discussed anonymously. The data will be destroyed after the standard amount of time required to maintain research data.

Intervention Activities

Since I was employed by a local IT organization, careful consideration was given to the organization, departments, and product families within the organization that were asked to participate. To eliminate any conflict of interest, the goal was to leverage organizations that were not affiliated with my place of employment. If that organization was used as a backup organization, then subteams that were not directly related to my area of responsibility were utilized.

The appropriate level of approvals were obtained and by following this approach there were no power differential boundaries crossed. I did not anticipate the need to offer

any incentives to encourage participation, so none were offered. An ample number of participants responded willingly to participate in the study.

Summary

This chapter provided additional detail into the methodology used in this study. The qualitative research design was clarified with respect to the research questions addressed as well as the phenomenon of leadership characteristics and their existence in flexible IT environments. Case studies were used in this study; individual study participants and their experience working in a flexible IT environment represented each case. The participants ultimately worked in successful and unsuccessful flexible IT environment, but no matter the experience, the feedback allowed for the determination of specific leadership factors that can ultimately enable flexible IT environments.

The role of the researcher was also discussed and in both potential scenarios of identifying participants, the role of the researcher was structured to eliminate any researcher bias or influence on the participants. Ethical procedures were also discussed with respect to the research's role. In addition, the process for how data were gathered, analyzed, maintained, and ultimately disposed of in order to protect the privacy of the participants and integrity of the study was discussed in this chapter.

All of this information was used collectively to implement the study. As the participants were identified and data gathered, the analysis process began and leadership themes were identified. The findings of the study are summarized in the following chapter along with specific information regarding how the actual data gathering and analysis process turned out. In addition, the trustworthiness of the data and the data

analysis process are also discussed. The primary goal of the upcoming chapter is to present the full set of results based on the parameters discussed in this chapter.

Chapter 4: Results

The purpose of this case study analysis was to discover if there were common leadership characteristics that could be utilized as components to the IT flexibility model (Ness & Chebrolu, 2013). The information was gathered based on the perspectives of IT professionals from a global software organization. The goal was to gain leadership insights from their experiences with successful and unsuccessful IT projects during their careers. The foundation of this qualitative case study analysis was based on the following research questions:

RQ1: What are the leadership characteristics exhibited by IT organizational leadership to establish a flexible IT environment?

RQ2: What are the leadership characteristics exhibited by IT project team members to maintain a flexible IT environment?

The themes that surfaced from the data analysis were used to answer the research questions and are discussed in the results section of Chapter 4. In addition, Chapter 4 provides detailed insights into the research setting, participant demographics, data collection process, data analysis process, and a discussion of the trustworthiness of the data gathered. The research setting section covers any conditions that may have influenced participants or their experience at the time of the study. The participant demographics section contains relevant information regarding the participants' work history. The data collection section addresses how the data were collected and maintained relative to the methodology discussed in Chapter 3, and the data analysis section provides

insight into how the raw data were transitioned into the themes to answer the research questions.

Research Setting

I conducted the interviews for the study on location at the participants' place of employment. All interviews were scheduled during normal business hours at a time that was convenient for the participant. The interviews occurred within 2 weeks of most participants returning from their holiday vacations so their respective teams were in the process of planning and getting work efforts started for the new year. Overall, the participants seemed more willing to assist given the time of year because they were not fully inundated with large workloads or pending deadlines.

There was one participant who did request multiple reschedules to accommodate other commitments that needed to be completed. Thankfully, the participant desired to be involved with the study, and we worked together to identify a mutually beneficial day and time to complete the interview. There was a second interview participant who became ill, so the original interview day and time had to be rescheduled. The interview was delayed by a few days but was still completed within the 2 weeks communicated in the invitation letter.

There were no changes in budget, personnel, or leadership that impacted participation. Half of the participants reached out directly, providing their consent to participate after the invitation letter was sent. The other half were sent reminder requests approximately one week after the initial invitation letter was sent. All except two requests were positively responded to and consent to interview was provided. Several stated that

the original request had simply gotten buried in their e-mail after they did not respond right away.

All participants were interviewed willingly, and their participation was completely voluntary. As such, there were no occurrences in the company or teams involved that influenced the interpretation of the study results. The two potential participants who declined to be interviewed communicated that it was their preference not to participate in the study. They had no specific concerns with the topic or researcher, they just did not want to participate in the interview process. Of course, their requests were honored and they were not approached again.

Demographics

I selected 20 IT professionals as participants for this study via the purposeful random sampling method. All participants were from a single software development organization that produces a suite of IT solutions and delivers IT services. The IT professionals were not in official leadership positions in the organization, such as supervisor or manager. Each participant was considered a separate case in the multiple case study (Yin, 2014). I compared and contrasted the information gathered from each participant for the purpose of data triangulation and to further ensure trustworthiness of the data. The common aspects in responses despite differences in job role and length of service helped to solidify the credibility and dependability of the data as discussed later in the chapter.

Table 1

Participant Demographics

Participant	Title	Years of experience	Years of IT flexibility experience
1	Software developer, Scrum master	18	18
2	Software developer	4.5	3.5
3	Performance developer/tester	10.5	6
4	Software developer, Technical lead	35	35
5	Software developer	3.5	3.5
6	Architect	25+	18
7	Information developer	18	12
8	Software developer	17	17
9	Software developer, Scrum master	5	5
10	Information developer	16	16
11	Software tester	4	4
12	Information Developer, Editor	9	9
13	GUI developer, Technical lead	10	4
14	GUI developer, Architect	31	10
15	Performance analyst	21	21
16	Software tester	18.5	10
17	Software developer	2.5	2.5
18	Architect	19	8
19	Software tester	20	5
20	Software tester	19	6

The organization that the participants worked for used Agile software development principles. In Agile, a *scrum team* or a cross-functional team of individuals works together to produce the features and functions of the product in a short development cycle called a *sprint*. The goal is to iteratively produce a quality product through team collaboration and customer feedback. The scrum teams in this organization typically consisted of multiple *software developers*, *software testers*, and at least one *information developer*. The software developers who participated in this study wrote software code as their primary job role. Some had additional responsibilities to the team such as being the *scrum master* or the *technical lead*, however these were nonmanagerial roles.

A *scrum master* is the facilitator for a scrum team and works to ensure all requirements and schedules are understood and followed. Scrum masters run status calls or scrum meetings and relay information to interested parties outside of the scrum team regarding status, challenges, and the interlock of the scrums' deliverable with other scrum teams. *Technical leads* have a deeper knowledge of the underlying technologies being used and developed. Often, the technical leads work ahead of the scrum team members to ensure the work to be done is fully understood and the work efforts are clearly defined for upcoming sprints.

The *software testers* in this study were responsible for confirming that software developed met design and customer requirements. *Performance engineers* had both development and test responsibilities but with a focus on the performance of the product

versus core functionality. *Information developers* produced technical information to ensure the products functioned properly and were easy to use.

The participants who classified as architects maintained a technical oversight role within their teams, though this was a nonmanagerial role. Each architect also had responsibilities for writing code, testing developed solutions, or technical writing as their primary role. Each job role defined here could also have scrum master responsibility, but that was only specified by two participants in this study.

Data Collection

I collected data for this study from 20 participants from a single software development organization. All interviews were conducted on-site at the participant's place of employment. I interviewed each participant only once, and all interviews were conducted over a 2 week span. Each interview was conducted in a private office and was free from external distractions. There was also enough time scheduled between interviews conducted on the same day such that there was no interaction between participants coming in or going out of the interview location. This was done intentionally to prevent any influence of responses based on others who might be known to participate in the study.

The interviews ran for approximately 20-25 minutes, which fit within the 30 minute window communicated in the participant request letter. The participant was given a brief overview of the study and a reminder that the interview would be recorded. In addition, they were informed that notes would be taken manually. They were given the opportunity to ask any questions or decline if they were opposed in any capacity to the

interview plan or the study. All participants agreed to continue with the interview at this point; no one declined to move forward.

I conducted the recordings using the Audacity recording software. I started and stopped the software manually at the beginning and end of each interview. I ran the software on a password protected laptop system that was not used for any other research purpose during the interviews. Upon the completion of each interview, the recordings were immediately saved with a generic and therefore confidential title "InterviewXX.wav" where the X represented the interview participant number. The interview recordings were also saved on a password protected physical hard drive after each day of data collection for backup purposes.

During the interview, I manually recorded observations and notes as well. I took the notes on a blank interview template that had the questions pretyped to ensure all participants were asked the same questions. The participants could see the interview template and what was being written during the interview process. At the completion of each day of interviews, I reviewed the notes taken and typed them up to ensure accuracy. The files were immediately saved with a generic and therefore confidential title "ParticipantXX.doc" where the X represented the interview participant number. The files were also saved on a password protected physical hard drive for backup purposes. Both the interview recordings and the notes files were then uploaded to the NVivo software for analysis.

The only variation in data collection per what was outlined in Chapter 3 was that two of the interview participants were interviewed remotely via phone. In both instances

the participants came highly recommended by the program director of the organization who also signed off on the consent form. As such, when the participants requests were sent and both accepted the invitation, I made slight adjustments to ensure the data collected would be acceptable. As such, I conducted interviews via phone; however, all other elements of the data collection process remained the same. There were no other unusual or unexpected circumstances that impacted the data collection process.

Data Analysis

The qualitative interview process for 20 participants produced a substantial amount of data to be considered. To analyze and interpret the data effectively, a combination of deductive and inductive analysis was used.

Deductive A Priori Coding

The deductive process or theory driven coding was completed in order to visually see how the data fit within the primary conceptual frameworks on which the study was based. The goal of the deductive a priori method of analytical analysis was to provide an initial matrixed framework for the data. The interview notes were manually parsed and the data were fit into a matrix with the elements of empowerment theory and the situational leadership model as its categories.

Table 2 represents the results of the a priori coding exercise for the first research question. The purpose of the interview questions for the first research question was to elicit responses regarding organizational leadership. The codes represented in the table were referenced by at least 2 participants. Over half of the codes were mentioned by 4 or more participants with communication being mentioned the most by 11 participants.

Knowledge and expertise, vision, and trust were mentioned 9 times each, which was the second most of any of the a priori codes.

Table 3 represents the results of the a priori coding exercise for the second research question. The purpose of the interview questions for the second research question was to elicit responses regarding project team leadership characteristics. The codes represented in the table were referenced at by at least 2 participants. Again, communication was mentioned the most frequently by 11 participants, followed by collaboration and sharing expertise both mentioned by 6 unique participants.

Table 2

Research Question 1: Organizational Leadership A Priori Coding based on Situational Leadership and Empowerment Theories

	Telling/ directing	Selling/ coaching	Participating/ supporting	Delegating
Educate	communicate expectations – detail, vision	transparency		
Lead	planning skills	awareness, poised during change, emotional intelligence, motivational	Flexible, optimism, preparation, positivity, organization, goal oriented, leading by example	
Structure		data drive, knowledge, expertise, understand business and customers	Decision maker, respect for others, know the team, creativity	ownership
Provision		enablement, provide assistance, team builder	staffing – people and tools.	
Mentoring			Open to questions and feedback, collaborative, honest, sincere, empathy, humor, strong faith, feedback	
Actualization			Trust, recognition, accountability, empowerment, engaged	Confidence, autonomy

Table 3

Research Question 2: Project Team Leadership A Priori Coding based on Situational Leadership and Empowerment Theories

	Telling/ directing	Selling/ coaching	Participating/ supporting	Delegating
Educate	dictator style	giving positive direction	sharing expertise, can work independently	
Lead		open to change, emotional intelligence, motivational	communication, investigative spirit, collaborate, lead by example, drive, organization, listener, diplomatic	
Structure		detail oriented, understand business/customer, data driven, product knowledge	thinker, build relationships, shield from upper management, flexible, understands team skills, coordination	
Provision		provides assistance	process improvements	
Mentoring			open to questions and feedback, humor, collaborative, prayer	
Actualization		enthusiasm, encouraging, compromise	thoroughness, trust, accountability, servant leader, acknowledgement, recognition, teamwork	

Given the amount of data gathered and the number of responses that were given by multiple participants, it became clear that the data would have to be effectively placed into more useful and granular categories. In addition, the placement of the feedback into the given categories was objective. Some of the responses could have easily been placed in multiple categories with respect to the empowerment and situational leadership theories. The interview notes represented what I was able to capture during the live interview process in writing therefore potentially not a full representation of the data versus purely what was communicated by the participant.

Given the difficulty of capturing the exact words of the participant in written notes, often times a summarizing term or paraphrase would be used instead in the manual notes. Though deductively coding the written interview notes provided a much needed initial structure for the data, it did not provide a standalone interpretation of the data to effectively answer the research questions. It became most beneficial to synthesize the a priori coding with more latent results obtained from an inductive coding process.

Inductive Coding

I then analyzed the data inductively in order to allow the data itself to influence the patterns that would be observed (Braun & Clarke, 2006). This was a data driven form of analysis to eliminate any researcher bias and confirm any themes that may not have seemed obvious coming out of the interviews. Likewise, conducting this form of analysis after the deductive method helped confirm potential themes as well as highlight areas that may not have seemed significant with only one form of data analysis. Initially semantic coding was used in order to break out the data into general categories. As the data

analysis progressed the codes were refined and became latent as each theme began to reflect an interpretation of the participant's responses (Braun & Clarke, 2006).

The inductive coding process was completed by manually transcribing all information from the recorded interviews. Each interview ranged in length but took approximately 30-45 minutes each to accurately transcribe. The audio files were uploaded to the Nvivo software and manually transcribed within the tool. Once all 20 interviews were manually transcribed in the Nvivo software tool, the data did yield a significant about of information and potential categories. Each category identified from the transcriptions was considered with respect to the a priori coding results, thus eliminating researcher bias as information not obtained directly from the transcripts was not used. This substantive analysis process allowed me to identify emergent themes by considering the meaning of the information shared by the participants with respect to my summarized notes and the conceptual framework (a priori) analysis.

Emergent Themes

The first set of interview questions focused on organizational leadership in flexible IT environments. The questions were designed to get feedback from participants based on specific business scenarios or conditions. Three of the interview questions were asked such that the participants' responses would indicate their desired or preferred leadership characteristics given the scenario in the question.

However, the fourth interview question used in this section asked the participants to indicate what they observed or experienced on an unsuccessful or struggling IT project. The responses received to this question almost always indicated the "lack of"

some leadership characteristic that was identified as needed in the responses to other questions. This trend was common across multiple participants as the lack of characteristics were widely viewed as required by the participant pool as a whole. The identification of this relationship in the participants' responses was key to being able to identify emergent themes as shown in table 4.

Table 4

Research Question 1: Organizational Leadership Emergent Themes

Theme	Referenced
Adaptable to change	19
Awareness of product and team	14
Communication	33
Trust	11
Vision	27

The themes highlighted here were mentioned by multiple participants in the study and in many cases mentioned on several occasions by the same participant. The data in table 4 represents the number of time a reference occurred within the same interview and across the entire interview sample. The importance of each identified theme can be better understood through some of the comments shared by the study participants.

Adaptable to change. Participant 1said,

> Leadership must be well poised at responding to change. Good leaders I've seen in my organization understand that things can change and they prepare for that. They get expertise from around the team to understand the situation from the beginning.

Participant 6 stated, “In an organization like this where there are many management touch points. The ability to make a decision without having to go through the hierarchy is important.” According to Participant 12,

> I think of the Japanese philosophy Wabi Sabi. The idea is to accept that no is perfect and our circumstances are always changing. Don't have a lot of expectations. When the unexpected happens you'll just be cool, calm, and collected.

Participant 13 added,

> Willingness to change the plan accordingly. A lot of times, I've been on teams where once a plan is in place, that's it despite the feedback that they get. Leaders that struggle have an unwillingness to change and adapt to feedback given to team.

Awareness of product and team. Participant 1 stated,

> Awareness—be aware of what people under you are doing. It is great when my managers know what’s on my plate, recognize the effort and amount of work, and get help when needed. Not just at a status meeting level, but what is really happening.

Participant 2 said, “Good leaders can communicate the plan from end-to-end and track it. Thinks through the problem and has that breadth. Don't have to have deep technical knowledge but surrounds themselves with people who do.” Participant 11 said, “My manager knows what is going on all throughout. He is very informed, not only in what is going on around him but also in the technical aspects where he can pitch in and chime in

with suggestions. Participant 15 added, “Knowing your subjects. Knowing what they are good and what they are not good at. Get out of the way for the stuff they are good at and recognize when they need a push in the right direction.”

Communication. Participant 2 stated,

> Lack of communication is a problem. There were times when people silently struggled and the organization as a whole wasn’t really sensed to be open to that kind of thing. If you are struggling there should be someone there to help or someone who is urging the team to be upfront with those types of things. When people are silent things tend to blow up towards the end.

Participant 10 said,

> Clear communication about the expected results and also whenever needed, about the culture of the team and tools that we will rely on. They can choose different tools for communication and expectations, that kind of thing is really helpful. The organization may be flexible but the team has a culture and needs set expectations.

Participant 11 stated, “Because of lack of communication there wasn't an agreement to the point where we had to redo a lot of stuff because we missed a specific detail.” Participant 13 added, “Meetings with leadership and team to solicit feedback from the different initiatives and feedback coming down the pipe. A great way to ensure everyone is on board.” According to Participant 18, “I would say number one, communication. Communication is paramount, absolutely paramount.”

Trust in the team. Participant 4 said, “I think a big piece of it is the leadership having the trust in their people to be able to do the work. When there isn't that trust in both directions things tend to start to fall apart.” Participant 8 stated,

> I think a large part of it comes down to a balance between how much the leader is micromanaging versus trusting the people they are leading. To me it comes down to that because if they are too “micromanagy” then it could impede the work that you could get done, but if they are too open and don't define the tasks then the person could meander and not seek help when they need to. The best team situations I've been in have had a nice balance between those two extremes.

Participant 17 said,

> High level of trust in everyone on the team. Both in terms of trusting the people to be able to get the job done, and they trust you as the leader. If they tell you this can't be done in this timeframe or it isn't going to work, then you will believe them.

Participant 19 added, “I see more success with leadership that trusts their team and is less micromanaging and allows them to use their skills to get to the end goal.”

Vision for the future. Participant 1 stated,

> Presenting the vision correctly from their point of view. What is the purpose, what is the direction of this project or whatever it might be. Sometimes I still question why we are doing things. Yes it is cool technology but how is it going to payoff is sales or revenue. Sometimes it seems like we are doing things for tactical reasons, but not practical reasons.

Participant 10 posited, “I think that when you have a Leader that can cast a vision about where they want the team to go, then people have a better idea of what everyone is marching too. Seem more cohesive as a team.” According to Participant 14,

> Even though there is flexibility there needs to be some sort of organization. People need to have roles defined, expectations defined, but yet not have the sense that it is a rigid boundary. “I can't do this work because it’s not my job”. Should be really organized towards near and long term goals, so when they are working on things the team knows it is working toward an achievement.

Participant 15 stated,

> Clear overall project goals. This is what we are doing, here is the end game. This is what we are trying to do for us and our customers. Here's how we can do it and do it better than anyone else. Sometimes we fall into trap of playing catch up to competitors.

The second set of interview questions were focused on project team leadership. The questions were designed to understand the positive and negative leadership characteristics that the participants have used themselves as well as experienced on a project team. By asking the questions about leadership characteristics either used or experienced that may have had a negative impact on a project team, several lack of some leadership skill responses were generated.

These responses again helped to solidify the key themes as they were directly called out as needed or required by many participants while also being highlighted as a characteristic that was lacking when teams or projects went on to struggle. The feedback

received and the data analysis process yielded 3 emergent themes that suggest key characteristics needed by project teams and project team leadership. Again the importance of each identified theme can be better understood through some of the comments shared by the study participants.

Table 5

Research Question 2: Project Team Leadership Emergent Themes

Theme	Referenced
Collaboration	21
Communication	24
Servant leadership	20

Collaboration. Participant 2 said,

> I feel like I collaborate often and I'm never really siloed. As a result of that it percolates to everyone in the organization. Everyone is aware of what I'm working on and doing. As a result you do not have to bring people up to speed all at once.

Participant 9 stated, “We collaborate and acknowledge people's ideas. Discuss them. Takes responsibility for own work. Participant 18 added, “Lots of working sessions and checkpoints. Creating an open forum for problems, ideas to come out. Allowing team members to carve the path as much as possible, on their own.” According to Participant 19,

> I have had success, saying, "This is what works for me," and if there is another way to do something, I want to learn that too. As a team leader, want multiple

> options to be presented to the team so they can determine the best solution for them.

Communication. Participant 7 stated, “Excellent communication. Everyone does their due diligence, so everyone is empowered. We communicate but everyone is independent so we don't have to do a lot of babysitting anymore.” Participant 11 said,

> Communication is important. Building people, investing in them. Making sure everyone is on the same page and informed. Ensuring the team is built together in unity. Knowing about other people strengths and weaknesses so you know who to ask for specific questions and where help can be provided.

Participant 14 added, “There has to be somewhat frequent communication. May not be daily, but at least a few times a week. The ability to communicate any time an issue comes up”. Participant 20 said, “Communication and letting people know what you are up to. Especially if you are working in a slightly different team. Making sure everyone is doing their fair share. Accountability to yourself and team as a whole.”

Servant leadership. Participant 7 said, “Completely a part of the team and doing as much work as everyone else. Not just handing out assignments and overseeing efforts. Feels like a solid part of the team and the team seems to appreciate it.” Participant 14 stated, “Willing to work a problem that has come up when it is not directly your issue or something you caused. The sense that the team is willing to discuss problems and assist.” Participant 17 concurred, saying, “Willing to drop what they are doing and help anyone. You can approach anyone with a question and they will try to help you.” Participant 18 added, “Being humble, sincere, and leading by example.”

Discrepant Cases

Each participant in this study was considered a separate case for analysis (Yin, 2014). There was no case that was considered discrepant as all the participants provided information that was relevant and applicable to the study. However, through the data analysis process there were references or suggestions made that were not specifically related to the research questions. For example, one participant mentioned that the teams were sometimes spread so thin that it was hard to get work done. Though this is valuable feedback, it is not directly relevant to this study with respect to leadership characteristics. This feedback and other similar feedback was noted throughout the data analysis process, particularly during the transcription process. However unrelated keywords were coded as a separate entity to prevent merging with other categories and subsequent themes.

Evidence of Trustworthiness

Credibility

As stated in Chapter 3, the primary means to establish credibility of the data was through the use of triangulation. This occurred during the data analysis portion of the research process. The data used for triangulation were the manual interview notes, the recorded interviews and the subsequent transcription files, the coded results from the Nvivo software. The availability of the recorded data ensured that the manual notes taken were accurate and not subject to researcher bias. If the notes taken were unclear, they were clarified with the recording and transcripts. In addition, each participant was considered a case in this study and it is clear that relevant and similar feedback was provided which led to the emergent themes.

Given the data triangulation that occurred, member checking was not implemented in the sense that the participants had the opportunity to review the notes taken. Through the interview process they may have been asked to repeat information that was unclear or verbally confirm the notes that were taken, but there were no second meetings held for individual review. As requested by many participants, a copy of the completed study as well as a summarized version were provided upon completion for review.

Transferability

Transferability was achieved through the data saturation strategy. Purposive random sampling was used to select 20 participants for this study with varying backgrounds in software development. By design, none of the individuals were managers or supervisors in their current organization because I wanted to gain the insights of the employee implementing IT flexibility solutions. However the participants represented several different software development roles within the organization including software developer, architect, test engineers, and information developers. Given their diverse backgrounds and career history, common themes gathered from the data collected naturally had greater transferability to a larger population or a separate software development organization.

Dependability

The dependability of the data was verified through the use of triangulation. Common themes emerged despite a participant sample with a diverse background in the software development industry and diverse roles, currently. Sample interview questions

were also provided to the participants during the participant invitation process. Although it was unsolicited, feedback was received over the course of the interview process that the questions asked of the participants were thought-provoking and relevant to today's experiences.

Confirmability

The confirmability of the data was established by relying solely on the data collected to identify the emergent themes. Themes were identified through the analysis of a large quantity of qualitative data from 20 participants. Each participant was asked the same eight core interview questions which generated a significant amount of information for consideration. After working through the data analysis process for 10 interviews, no new themes emerged that had not already been discussed. This further solidified the confirmability of the data as common characteristics and themes emerged. Lastly, the manual notes and interview recordings and transcripts were triangulated to ensure no additional information was added or considered.

Results

The qualitative interview process of 20 software development professionals yielded a significant amount of data. Each participant was asked a total of eight interview questions that requested their perspective on leadership characteristics in a flexible information technology environment. This section contains the results from the data analysis process outlined earlier in the chapter and is discussed from the perspective of each research question.

Organizational Leadership

The first research question of the study asked, “What are the leadership characteristics exhibited by IT organizational leadership to establish a flexible IT Environment?” The first four interview questions centered around answering this research question. Through the data analysis process, over 20 keywords, categories, and themes were deduced to three specific answers to the research question.

Communication emerged as the most prevalent leadership characteristic that is necessary for leaders to establish a flexible IT environment. It is not just the ability to be able to address a team or individual, but the ability to be able to receive communication as well. This means making yourself available to the team so they feel comfortable approaching you with status or problem. Likewise, being an active listener to the requests or problems at hand, taking feedback into serious consideration, and then acting as appropriate.

Participant 1 stated,

> Ability to communicate, expectation and technical details. It works both ways with people in charge . . . if you want to call those leaders. Here is what we are doing and here is how we are going to do it. The people doing the work also need to be able to communicate that I understand and can do it. If I get stuck, I need the ability to ask questions and also the ability to figure in between the lines. I've been told to do xyz, and I need to be able to figure out between x and z. If I can't figure that out then I need to be able to ask questions.

Participant 3 also provided feedback that reiterated the need for well-rounded communication, explaining how it is not a one-way street and requires being able to engage with all members of a team. The participant stated in response to the interview question regarding leadership characteristics in a successful flexible IT environment,

> Communication skills and not just one type. The ability to explain themselves and communicate with people are different. Some may want or need to see more charts. The leader has to recognize these difference and communicate the vision or path we are moving towards collectively.

The ability to communicate and listen or receive information ultimately builds strong awareness of the team's activities and challenges. The leadership is then able to work with individuals or the team as a whole to address situations more effectively.

The leadership having a vision for the team was the second factor identified to answer the research question. This leadership characteristic was important to the participants as they expressed wanting to feel as though they were being guided in the right direction. Participant 1 stated that it is important for a leader to be

> presenting the vision correctly from their point of view. What is the purpose? What is the direction of this project or whatever it might be? Sometimes I still question why we are doing things; Yes it is cool technology but how is it going to pay-off in sales or revenue. Sometimes it seems like we are doing things for tactical reasons, but not practical reasons."

Having a vision for the team provides a sense of organization that allows employees to concentrate on their work at hand versus having reservations about what is

coming next. It also helps to instill confidence in the team based on the idea that the leadership team has a vision established for what they want the team, product, and business to achieve. The team functions in a more cohesive manner because everyone is on the same page regarding team goals. Participant 11 stated that "Knowing the goal and knowing the vision is like the light at the end of a tunnel. It is also good to know the reason behind decisions being made."

The ability to thrive and communicate with a team is a critical skill, that also involves being aware of the team needs and considerations as well as the business expectations. A leader must be able to seamlessly merge these fields of thought, even though they may be divergent, and generate the necessary agreement and excitement to motivate the team to get the work done. A leader must be able to exude confidence when communicating the vision, the original key leadership factor, in order to ensure the team is onboard and ready to work. It also assures the team that the manager is on board and willing to work with them.

The leadership has to be able to demonstrate that they are also invested in the vision and goals for the program. Participant 14 stated, "A sense that the leadership is with you on the journey. They are not aloof; they are not pounding their fist from the ivory tower so to speak. They are relatable to some degree." Participant 4 also stated, "Having a vision, being able to communicate it and generating excitement is important to facilitate change in an organization as well."

The final answer to the first research questions as driven by the data collected is the ability of the leadership team to manage change. In order for leaders to be successful

in flexible IT environments they must be willing to accept and make the necessary adjustments to respond to change. Participant 18 said leadership must have an "openness to new ideas," and based on those new ideas, Participant 12 put it simply by saying that the leadership must have the "ability to easily pivot." Flexible IT environments are likely going to be in a state of change often, so being able to manage that change also includes having enough trust in oneself and the team to be able to handle the changes that will come.

Participant 13 stated, "Leaders trust their team. Trust them to make the decisions they need to make but are actively involved." The more trust there is among the team and the leadership, the easier it will be to work through change and difficulties together to obtain a solution that is beneficial to the everyone, including the product and all stakeholders. Participant 19 stated "I see more success with leadership that trusts their team and is less micromanaging and allows them to use their skills to get to the end goal." The end goal is a moving target in many software businesses and the ability to manage that change through trust in the team is important to being successful.

Project Leadership

The second research question asked, "What are the leadership characteristics exhibited by IT project team members to maintain a flexible IT environment?" There were four interview questions used to gather responses to answer this question. Two questions were meant to elicit a positive response and two questions were meant to elicit a response of dislikes. After an analysis of all responses two primary themes emerged from the keywords and categories as answers to the second research question.

Communication surfaced as the most important leadership characteristic for project team leadership to use to maintain a flexible IT environment. Again, it was determined that active communication is critical, so not just the ability to articulate with peers but the ability to listen and respond in a productive manner. Participant 4 indicated that "heated discussions sometimes occur within the team environment," which is not conducive to the team being productive.

Part of being an effective communicator is being able to control emotions and working with the team to determine an appropriate solution. When working within a project team, communication is also critical to sharing expertise and ensuring the entire team is informed and working towards the same goal. Participant 20 pointed to "communication and letting people know what you are up to. Making sure everyone is doing their fair share. Accountability to yourself and team as a whole."

Although individuals may be responsible for different things within the team, communicating and understanding what the larger team is doing will help to ensure that the team goals can be accomplished. When asked what leadership characteristics they use to successfully function within an IT project team, Participant 15 said,

> Sharing all the knowledge I can. Relay what I know. Try to convey the hints and tips that I use to other folks so they can be more efficient overall. The more knowledge about what we are trying to do the better everyone can be.

For project teams to effectively work together, communication—both sending and receiving—is a critical leadership characteristic for project leadership as well as the individuals on the team.

Exhibiting the behavior of a servant leader was the second theme that emerged as an answer to the second research question. Being a servant leader encompasses many leadership characteristic including collaboration, leading by example, and being motivated. Participant 7 described being a servant leader as "completely a part of the team and doing as much work as everyone else. Not just handing out assignments and overseeing efforts. Being a solid part of the team and the team seems to appreciate it." Even as the project lead, ensuring that there is no distinction within the team from a work effort perspective and everyone is working together through effective collaboration is critical to the success of the team. Participant 2 stated,

> I feel like I collaborate often and I'm never really siloed. As a result of that it percolates to everyone in the organization. Everyone is aware of what I'm working on and doing. As a result you do not have to bring people up to speed all at once.

Servant leadership means leading by example as stated by Participant 18 and being willing to put yourself in the position or mindset of your team, if and when needed. Doing so allows the team to function better together as a team. Participant 17 described it as being "willing to drop what they [the leaders] are doing and help anyone. You can approach anyone with a question and they will try to help you." Servant leadership characteristics enable the team to have more flexibility with regards to their work requirements by leveraging the teams motivation and personal drive.

Within a team setting everyone has to be willing to figure out what is needed to get their job done, after the initial guidelines have been provided. Per the findings for

research question one, organizational leadership should be able to effectively communicate the vision and goals for the team, but they may not necessarily define how each team member must get the job done. The responsibility of determining the best way to get the job done often falls to the project lead or the team in its entirety. At the team level, all individuals must have the motivation and drive to figure out the details. They must be willing to investigate to sort out the details and have a genuine desire to want to do things the proper way.

When asked about the leadership characteristics exhibited in a successful IT project team environment, Participant 1stated “The team must have the motivation and drive to figure it out, an investigative spirit. If you don't have the drive to dig into items further, it will be hard to be successful.” Participant 1 went on to say, “I’ve worked with people in the past that have done the bare minimum and don't worry about the peripherals.” Taking this approach and not having the motivation and drive as a core part of the servant leadership characteristic could prove to be detrimental to a team.

Discrepant Cases

There was no case that was considered discrepant as all the participants provided information that was relevant and applicable to the study. Each participant was considered a separate case (Yin, 2014) and all participants met the predefined criteria to be a participant in the study as discussed in Chapter 3. Not all feedback provided by the participants was relevant to answering the research questions as it did not pertain to or link back to leadership characteristics. For example, some feedback provided was more relevant to the organization’s business or human resource practices versus leadership

characteristics. As discussed in the data analysis section of Chapter 4, feedback unrelated to the research questions was coded separately to prevent blending with themes that were directly related to leadership characteristics and the research questions.

Summary

This multiple case study consisted of an exploration of demonstrated leadership tendencies from a global IT organization. The goal of the study was to determine common leadership characteristics in a flexible IT environment that could then be used as input to the IT flexibility measurement model (Ness & Chebrolu, 2013). The leadership characteristics were determined based on the perspectives of 20 IT professionals from a global IT organization with a diverse background and varying roles with the software development team. No managers or supervisors were asked to participant as the goal was to obtain the perspectives on the leadership characteristics needed by managers and supervisors – organizational leadership. In addition, the interview participants were asked to provide their insights on project team leadership. The following two research questions were addressed in this study.

RQ1: What are the leadership characteristics exhibited by IT organizational leadership to establish a flexible IT environment?

RQ2: What are the leadership characteristics exhibited by IT project team members to maintain a flexible IT environment?

In Chapter 4 I outline the data collection, analysis, and results that led to identifying the answers to these research questions. Research question 1 focused on organizational leadership and the themes that emerged were complete communication,

having a vision, and being able to manage change. Research question 2 focused on project team leadership and the themes that emerged were complete communication and servant leadership. Chapter 5 includes an interpretation of these findings and any limitations. In addition, there are recommendations for future studies and a discussion on the implications for social change.

Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of this qualitative case study analysis was to discover if there were common leadership characteristics that could be utilized as components to the IT flexibility model (Ness & Chebrolu, 2013). The goal was to determine which leadership characteristics are consistently identified as important in flexible IT environments. The leadership characteristics were determined based on the perspectives of 20 IT professionals with various roles and backgrounds in software development. These leadership factors can now be used as components to the IT flexibility model and organizations can use that information to recruit and retain compatible talent to fully leverage the IT environment for successful business results with strategic alignment and improved IT effectiveness. The following two research questions were addressed in this study.

RQ1: What are the leadership characteristics exhibited by IT organizational leadership to establish a flexible IT environment?

RQ2: What are the leadership characteristics exhibited by IT project team members to maintain a flexible IT environment?

In Chapter 4 I outline the data collection, analysis, and results that led to identifying the answers to these research questions. RQ1 focused on organizational leadership and the themes that emerged were complete communication, having a vision, and being able to manage change. RQ2 focused on project team leadership and the themes that emerged were complete communication and servant leadership.

Interpretation of Findings

According to Chebrolu and Ness (2013) and Jorfi et al. (2011), IT flexibility has been directly linked to an organization's ability to achieve business alignment and IT effectiveness. Organizations must be able to establish the appropriate balance such that the flexibility of the IT organization is sustainable but is also capable of supporting the needs of the business. This balance, or IT equilibrium, will vary between organizations and will also fluctuate within an organization primarily due to the many factors that must be considered when working to establish IT flexibility in an environment.

An IT flexibility measurement model was defined by Ness and Chebrolu (2013) as a framework that organizations could use to measure IT flexibility. The matrix is based on the integration of the results from the authors' IT flexibility studies and the CMMI, a tool to help organizations improve performance through the identification of gaps. According to Jones and Konrad (2011), the main constructs of the CMMI are people, process, technology, and tools. The resulting matrix contains several conceptual intersections that could be investigated to understand what specific factors must be considered when measuring IT flexibility.

The purpose of this qualitative case study was to identify the specific leadership factors that could be utilized in the people dimension of the IT flexibility matrix. According to Benson-Armer et al. (2015), building capabilities in all the core areas of CMMI is a strategic priority for companies. Organizations may choose to prioritize the order in which they work to build strengths in these areas, but finding an ongoing yet fluctuating balance between all four is important. Though all have equal importance, in

this study, the people dimension was the primary capability under investigation, specifically leadership characteristics within that dimension.

The results of this study extend the knowledge of IT flexibility by identifying leadership factors that could be used as criteria in the IT flexibility measurement model. This information was not previously available in the model proposed by Ness and Chebrolu (2013). It is valuable to understand leadership characteristics in flexible IT environments, because the leaders and the teams involved have a direct impact on project success and the ability to maintain flexibility. The results of this study can be leveraged to ensure that the leadership in an organization possess the ability to effectively communicate, manage change, and have a vision for the future. From a project team perspective, the results of this study revealed that communication and servant leadership are key factors to a successful engagement as a project team leader in order to establish and maintain a flexible IT environment.

The results of this study also confirm the existing literature in that the specific elements identified as key to IT flexibility are already referenced in various conceptual frameworks such as transformational leadership and organizational change management. Transformational leadership involves leading by example (Andressen et al., 2011; Harms & Credé, 2010) or by servant leadership as identified in this study. Flexible IT environments by nature can be in a state of flux. To keep pace with the requirements and changes in direction, leaders must be able to adjust quickly and assist their teams in the process.

The results of this study indicate that just providing direction is not enough; rather, a transformational leader must also lead by doing. Often the best on-the-job training is witnessing your leadership team, whether technical or hierarchical, doing the things that they have also asked their team to do. It is important for leaders to not think of themselves as being more important that the others on the team, but instead working hard to function as a part of the team. This behavior could in turn inspire others on the team to be more engaged and give their best for the success of the team and specified goals.

Choi and Ruona (2011) determined that the introduction of change into an organization should be preceded by getting some form of concurrence from the team where possible. This indicates the important of communication (Kupritz & Cowell, 2011) and the leadership mindset that is needed for leadership to be successful in a flexible IT environment (Moerschell et al., 2013). In this study, communication was identified the most as a key factor in the success of flexible IT environments and IT project teams.

It is not uncommon for the hierarchy in leadership to discuss upcoming changes with peers and not communicate them to the teams and individuals who must do the work. Even when decisions are communicated, it may not always be done in the most efficient or effective way. Enough time must be dedicated for the communication of process changes in order to allow the team to understand the change, provide feedback, and buy in. Change can still happen quickly and often needs to in flexible IT environments, but a lack of communication can cause a delay in the rollout of flexible IT initiatives.

The results of this study also directly extend the knowledge in the IT flexibility field with respect to the conceptual framework of the IT-business equilibrium model (Ness & Chebrolu, 2013). The leadership factors identified can be used to identify individuals who demonstrate these skills at the needed level. That individual can then be recruited and hired to work with an organization to establish and maintain a flexible IT environment. The ability to maintain a state of equilibrium and to adjust to changes that might impact that equilibrium requires leadership to be able to manage the team through the change management process in a timely manner (Moerschell et al., 2013). The leaders would need to be able to mold decisions into a vision and then communicate that vision effectively to the team; both of these elements were key leadership factors identified in this study.

Empowered individuals have the ability to make certain decisions on their own that may ultimately impact themselves or the business. The expectation is that individuals who feel empowered will also feel more responsible for the outcome of the project and therefore will make wise decisions (Thomas & Velthouse, 1990). The results of this study indicate that individuals, especially within project teams, desire the autonomy to be able to make decisions.

The empowerment aspect manifests itself in the ability of teams and individuals to be able to communicate with leaders regarding changes of direction or process in the flexible IT environment. Allowing teams the opportunity to understand and buy in to the changes and the ultimate vision facilitates empowerment among the team and can ultimately lead to improved performance and better decision making at the team level. As

such, the findings from this study with respect to communication and servant leadership confirmed the empowerment theory conceptual framework.

The original feedback received from the study participants was first framed in the context of the empowerment theory and situational leadership model in order to determine where overlaps may have occurred. The a priori coding results determined that not only was there overlap, but the study results fit well within the elements or categories that theorists had defined for the situational leadership theory (Hersey & Blanchard, 1969) and the empowerment theory (Thomas & Velthouse, 1990). The overall results of this study indicate that communication is the most important leadership characteristic needed in flexible IT environments. Communication was the leading leadership characteristic in both research questions, therefore for both organizational leadership and project team leadership. For organizational leadership, having a clear vision and being able to manage change were also identified; for project team leadership, servant leadership was identified in addition to communication.

All findings from this study either confirm or extend the conceptual frameworks used to frame the study. The results of the study show that communication is critical in leadership teams and project teams for flexible IT initiatives to be successful. As IT environments can be complex, it is important for leaders to rely on past experiences and skills to keep pace with the rapidly changing environments (Moerschell et al., 2013). The results of this study suggest key leadership characteristics that when used properly can likely alleviate some of complexities in flexible IT environments: communication, working from a shared vision, change management, and servant leadership. These

findings can be used as input to the IT flexibility measurement model in order to help determine and measure IT flexibility.

Limitations of the Study

This qualitative case study did contain a few limitations. The first limitation of this study was that the leadership characteristics identified were not correlated against each other to determine which might be the most important leadership characteristic in an IT environment. Although communication was mentioned the most often, a quantitative investigation into the relative importance of each identified characteristic would be interesting and beneficial. With that information, the findings could be ranked or weighted against each other based on priority or impact and then fit into the IT flexibility measurement model as appropriate.

Another limitation of this study was that the other components of the IT flexibility measurement model were not investigated. In order to be able to confirm a true formula to measure IT flexibility, characteristics in the other dimensions will also be needed. Similar studies could be conducted to determine what are the key factors needed in the dimensions of process, tools, and technology with respect to the components of IT flexibility, connectivity, compatibility, and modularity. Leadership factors were the focus of this study; however, there could be other people dimension factors that are worth considering as well.

An additional limitation to this study was the use of one software development organization for study participants. The purposeful random sampling method was used to select 20 participants for the study from a single software development organization.

Though the participant's backgrounds, roles within the organization, and length of service varied, it is possible that a different sampling of individuals could have yielded additional results. There is confidence in the findings of the study, especially the overarching identification of communication as a key leadership characteristic, however it is possible that some of the secondary findings may have manifested themselves differently.

Finally, considering organizations with non-IT core businesses, but in-house IT infrastructures, would have been a unique approach to this study. There are organizations whose primary responsibility is something outside of software development, however they maintain a flexible IT environment to support the business. Interviewing participants from multiple software development organizations or including participants from non-IT organizations, would have also strengthened the confirmability and transferability of the study findings in addition to providing a new perspective on the research questions.

Recommendations

The results of this qualitative case study to determine common leadership factors in flexible IT environments suggests several areas for future research to further define an IT flexibility equation. This study focused on the people dimension of the IT flexibility measurement model (Ness & Chebrolu, 2013), so future research is recommended to determine if there are common factors in the dimensions of process, technology, and tools that could be utilized in the measurement model. The primary finding of this study was that communication was the common characteristic from the perspectives of organizational leadership and project leadership, with communication being discussed the

most in response to both research questions. The implication is that communication is the key factor needed in the matrixed elements of connectivity, compatibility, and modularity. A recommendation for future study would also be to quantitatively determine how much communication indeed has an impact on these IT flexibility components individually.

It may be that communication is equally important to all three components or it could be there is a specific area where communication is more important to IT flexibility. A broader qualitative study is recommended to determine if other leadership factors, besides communication may be a factor in each of the IT flexibility components of connectivity, compatibility, and modularity. When considered more specifically, it could be determined that for each IT flexibility element within the people dimension, there is a specific leadership characteristic that is most needed for a team to be effective and successful in specific realm of IT flexibility.

The results of this study also indicated that from the perspective of organizational leadership, having a vision and being adaptable to change were key characteristics for IT flexibility. From a project leadership perspective, servant leadership was identified. Communication was the most often discussed leadership characteristic whether the leadership lens was organizational or project team. A recommendation for future study would be to quantitatively investigate these finding to determine their relevance with respect to one another and the IT flexibility components. Although communication was mentioned the most often in this qualitative study, a quantitative study using the findings

from this study as a baseline could dig deeper in the balance between communication and other leadership characteristics, across the board.

Future studies in this area could also investigate organizational leadership and project leadership independently. Based on the findings in this study, there was some overlap but investigating them individually may enable a deeper level of analysis. Depending on the results of such future studies, it might be feasible to narrow down the people dimension variable of IT flexibility to one concise variable versus a compilation of several.

An additional recommendation for future study would be to conduct a research study similar to this one, however expand the research participants. As discussed in the limitations section multiple software organizations would be useful to see if the same leadership factors were identified across multiple organization. Although the number of participants was acceptable from a data saturation perspective, maybe dividing the number of participants across one or more organizations would help to further triangulate the data obtained.

Another follow on study would be to gather participants from organizations that run non-IT businesses but have an in-house IT department on which they heavily rely. It might be interesting to determine if similar leadership characteristics are identified from within a IT group where IT or software development does not represent the core business of the organization. Such a study may also provide insight into whether there are differences with how IT flexibility is perceived within varying types of businesses. If being flexible at the IT level is not a part of the organizations core strategy, then it is

possible that other unique challenges may exist. Those unique challenges would need to be considered as potential factors to the IT flexibility measurement model as well, in the appropriate dimension.

The final recommendation for further research would be to determine how best to confirm a formula to be used to measure IT flexibility. The results of this study could be readily entered in the matrix, however having information grounded in research about the other dimensions would be beneficial as well. The more detailed the formula can become with specific, weighted criteria for measurement would be ideal. Once organizations are able to identify a flexible IT value or score for their organization, they could potentially measure on a regular basis to determine if IT equilibrium is being met or disrupted. If disrupted, then adjustments could be made to the teams or individuals impacting the specific areas and causing disruption. The overall goal being to ensure that business goals and strategic alignment are maintained with the support of a flexible IT environment.

Implications

The goal of this study was to identify leadership characteristics in flexible IT environments in order to be able to utilize those variables in an equation to measure IT flexibility. The findings from this study as well as the ability to measure IT flexibility, will have a positive impact on social change at the organizational, individual, as well as the academic level. Given the importance of flexible IT environments in all areas of business, the ability to identify what is needed to establish and maintain a flexible IT environment will lead to more overall business success (Chebrolu & Ness, 2013; Jorfi et al., 2011; Schmidt & Buxmann, 2011). Of course, IT flexibility is just one component in

an business model, but the ability to stabilize IT flexibility and thrive at an optimal IT-business equilibrium will enable organizations to focus on other parts of their business that may need improvement for overall business success (Chebrolu & Ness, 2013).

Organizational Social Change

By having an understanding of what is needed to establish IT flexibility, specifically within the people dimension of the IT flexibility measurement model (Ness & Chebrolu, 2013), organizations can leverage this information to identify individuals who would be a best fit for their IT leadership teams as well as project team leadership roles. From the perspective of both organizational and project team leadership, communication was identified as the most important characteristic in this study. This parallels the findings of Heide and Simonsson (2014) that highlights communication as being critical in all relationships. As such, upper management should ensure that communication channels are clear and effectively used throughout their organization. Individuals with excellent communication skills and potentially a positive relationship with the team could come into a flexible IT environment and acclimate themselves quickly to the needs of the team, ensuring communication lines remain open at all levels of the organization.

In addition to communication being the most popular theme identified through the research, other leadership characteristics were identified that potential candidates might possess. From an organizational leadership perspective, it is important for upper management to have a clear vision of what is needed as well as being adaptable to change. These elements are all closely linked as the team vision and changes to that

vision must be communicated in a manner that embraces all stakeholders and eliminates dissent (Heide & Simonsson, 2014). All three of these characteristics could be sought out by senior organizational leadership when filling positions to ensure that candidates have these qualities. Gaining an understanding of their history when leading or managing teams, as well as considering how change was handled in prior situations would assist senior leadership in ensuring the right candidate is selected for the role.

Similarly, from a project leadership perspective, hiring managers and upper managers alike can ensure that the right candidates are selected by considering their communication skills as well as their ability to be a servant leader, per the findings of this study. Servant leadership closely resembles transformational leadership in that it requires leading by example and being engaged with the team at the technical and personal level (Andressen et al., 2011; Harms & Credé, 2010). Some individuals, especially those with a more technical background, may struggle with leading a team. Several study participants indicated that it is challenging to step back from the technical work and tend to the needs of the team or share technical responsibility. As such, it is important for those managing the hiring decisions to ensure they consider someone who has positive prior experiences being a servant leader, communicating effectively, and leading a team towards successful project delivery.

Organizations could leverage the results from this study to develop and deliver more specific leadership education modules that help to build the skills internally that they feel are needed. If a new candidate or even an existing employee has a deficiency in one of the identified areas, the organization could provide the necessary courses to help

prepare them appropriately. At times individuals do not realize or do not want to realize that they may not be the most effective communicator, for example. The person could be strong technically but lack the ability to connect with the team.

By assembling a team of strategic leaders and technical personnel with the right skills and understanding geared to running a complex, changing IT environment, greater success could be achieved. The incorporation of leaders with the skills identified in this study will help to ensure project implementations and changes to the IT environment are more successful and therefore stable. The improved stability of the IT infrastructure would strengthen the ability of the organization to reach strategic goals set regarding overall IT-business alignment (Jorfi et al., 2011; Luftman, 2003). Through the stabilization of the IT-business equilibrium model (Ness & Chebrolu, 2013), organizations will be able to manage the supply and demand relationship between business strategy and IT goals.

Individual Social Change

From an individual perspective, the results of this study will impact positive social change by providing a baseline by which individuals can start to independently build their skills. Effective communication is a key skill when managing a team, especially through change (Kupritz & Cowell, 2011). If obtaining a leadership position is a part of professional's short or long term goals, then working proactively to build effective communication skills is an important prerequisite that could help accelerate career movement. Quality hiring managers will be looking at past experiences to gauge a

candidates level of communication skill, so it is important for the candidate to make the most of opportunities to strengthen those skills before actively pursuing such a role.

The same can be said for the other leadership characteristics identified in this study. An individual preparing themselves to pursue a position in a flexible IT environment would be wise to use current experiences and job roles to learn about establishing a vision and communicating that vision effectively. They could take the time to apply strategies to help manage organizational change in their current roles or observe others who seem to do an effective job in doing so. Taking opportunities to build the necessary skills and demonstrate one's abilities prior to actively seeking a position would assist in accelerating career movement.

Individuals could seek out the appropriate training via their professional organizations as well. Organizations such as the Society of Women Engineers, Association of Computer Machinery, and the Institute of Electrical and Electronics Engineers often provide specific leadership training in addition to deep dives regarding specific technical content. The Project Management Institute has provided studies that discuss talent management and the skills that organizations seek in project management professionals. The key leadership characteristics identified in this study resemble findings from the PMI and HSI (2014) study regarding talent management. As project management is at the root of project and team leadership, having an understanding of the results of this study as well as those from organizations such as PMI will give individuals insights that can be leveraged to build their personal skill levels.

Academic Social Change

There are many opportunities to leverage the findings of this study for positive social changes at the academic level as organizations continuously work to identify the appropriate talent for their workforce (PMI & HSI, 2014). Just as organization seek out specific degree holders, certain skills, or years of experience, they also seek out individuals who are known to have strong team communication skills, are visionaries, and have the ability to work through change. Today, one's ability to do these things coming out of college is usually based on a personal declaration of such skills on a curriculum vitae. Organizations have to decide whether to trust in those statement usually after some sort of interview process has been completed.

This assessment could become more qualified if colleges and universities established more courses around the areas of building soft skills such as communication and having a vision. Specific leadership courses could be provided as electives or even mandatory courses for degree completion whether a technical based degree or otherwise. By requiring students to take such classes, organizations will then know with more certainty the skills that candidates have in these areas based on their grades and the academic institution's assessment of the coursework. Of course, this will not guarantee that a specific individual is a perfect fit for an organization, however it will ensure that some level of leadership fundamentals are being taught at the collegiate level.

Colleges and universities could also develop formal cooperative education programs that enable students to work directly with organizations for the summer or over some period of time during the school year. Doing this will ensure students obtain

firsthand knowledge and experience of what is needed to communicate, manage change, establish a vision, and work as a servant leader. The assignments given during the work terms could be tailored to help students build the skills deemed necessary for the company to establish and maintain IT flexibility. As organizational changes occur, the students would see and potentially participate in what happens to manage the business under specific guidelines.

The introduction of leadership classes could also be rolled out earlier at the high school level as well. This would give students early insight into what it takes to work with an IT flexible environment by tailoring the curriculum to their needs. The sooner these skills can be learned by high school students, the more opportunity they have to practice and perfect them throughout college and then into the workforce. More focused leadership-based training over time would prepare individuals to have greater positive and sustainable impact on a business.

Overall, the positive social impact to academia would be structured educational programs at the high school or collegiate levels. The findings of this study could be taught and practiced through planned learning activities focused on establishing and building skills for success in flexible IT environments. New and existing resources could be groomed for success early in their careers. An increased focus on employee development could lead to improved organizational climate and employee satisfaction as well.

Conclusions

The purpose of this qualitative case study analysis was to determine if there were common leadership characteristics utilized in flexible IT environments that could then be used as variables in the IT flexibility measurement model. Two research questions were investigated to determine if common leadership characteristics existed.

RQ1: What are the leadership characteristics exhibited by IT organizational leadership to establish a flexible IT environment?

RQ2: What are the leadership characteristics exhibited by IT project team members to maintain a flexible IT environment?

Through the interview process of 20 employees from a software development organization and the subsequent data analysis, the results of this study indicate that communication is a key leadership characteristic as it was mentioned the most often across both research questions. In addition, having a vision and being able to manage change were identified from an organizational leadership perspective; and servant leadership from a project leadership perspective. The results from this study confirmed prior research that indicates these characteristics as being important to leadership and business success in general.

However, the results of this study are significant because they also fill a gap in existing literature by identifying these specific characteristics as actively present in IT environments and critical to flexible IT environments being successful. As organizations look to build or strengthen their flexible IT environments, they can seek out or train individuals to use these leadership characteristics effectively. In addition, individuals can

work on proactively building their skills in these areas for the potential pursuit of future leadership opportunities in flexible IT environments or organizations. Lastly, as organizations look for ways to quantify IT flexibility, these leadership characteristics can be used as initial inputs into the people dimension of the IT flexibility measurement model.

If future studies are conducted to determine which of the four leadership characteristic are truly the most important or potentially how to combine them into one, then that variable can be leveraged in conjunction with similar study results to identify the key characteristics in the other dimensions of the IT flexibility measurement model – process, technology, and tools. Enabling organizations to measure IT flexibility, identify or prepare individuals with the proper skills needed to maintain IT flexibility, and make seamless dynamic changes to their organization to ensure a successful IT environment will lead to more successful, stable organizations and improved business results.

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Appendix A: Interview Observation Protocol

The researcher will also have the role of an observer during the interview process. The current research design calls for interviews that will require participation through direct participant engagement. As an observer, the following will take place during each interview:

- Direct engagement with each participant
- Close attention will be given to body language and vocal queues given by the participants.
- Notes will be taken in addition to the audio recordings that will take place.

The participants will be informed that the researcher will be taking notes during the interview in addition to being informed that the sessions will be recorded. Each interview is completely voluntary, so if any participant disagrees they are able to stop the interview and remove themselves.

To prevent conflicts of interest and to maintain the integrity of the study, participants' name, organization affiliation, or any other personal information will not be shared in the study. That information will only be gathered to screen potential participants and will be maintained confidentially.

Appendix B: Interview Questions

Participation in this interview is completely voluntary. The information that is provided will be audio recorded, however it will NOT be video recorded. The audio recording, any notes taken, and the interview in general will be conducted in a manner that is confidential. Each study participant will be asked a set of predetermined questions to confirm prior experiences, experience with flexible IT environments, as well as their current job function within the IT organization. Additional questions may be asked and this information will be used solely for the purpose of ensuring compatibility with the proposed study.

Demographic Questions

1. Participant's job role
2. Managerial leadership position?
3. Participant's company (optional, if multiple organizations are used)
4. Time with organization in years/months
5. Years of flexible IT environment experience
6. Types of projects (Agile, Cloud, Continuous Delivery, other?)
7. Any other relevant IT environment?

Questions about IT organizational leadership

RQ1. What are the leadership characteristics exhibited by IT organizational leadership to establish a flexible IT environment?

1. Please tell me what leadership characteristics leaders of successfully flexible IT environments and teams have used?

2. Please tell me about any leadership characteristics that you have observed or experienced on an IT project that struggled or was unsuccessful?
3. Which leadership characteristics do you feel makes employees perform at a high level for the leadership team?
4. What do employees feel leadership should do to ensure employees are onboard when a new IT flexibility project or initiative is introduced?

Questions about IT project team member leadership

RQ2. What are the leadership characteristics exhibited by IT project team members to maintain a flexible IT environment?

1. Please tell me what leadership characteristics you have utilized in order to successfully function within a IT project team.
2. What are the leadership characteristics that you utilized that may have had a negative impact on your IT project team? Please describe?
3. What are the leadership characteristics your IT project peers have utilized in order ensure a successful IT project team?
4. What are the leadership characteristics your IT project peers have utilized that may have had a negative impact on the success of the IT project or IT project team? Please describe?

Conclusion

Please provide any additional information that you feel is relevant or important to implementing flexible IT initiatives and/or maintaining a flexible IT environment.